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COMPENDIUM

OF

HUMAN & COMPARATIVE

PATHOLOGICAL ANATOMY.

LONDON:

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A

COMPENDIUM

OF

HUMAN & COMPARATIVE

PATHOLOGICAL ANATOMY.

BY

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Translated from the German, with Additional Notes and References,

BY

JOHN F. SOUTH,

LECTURER ON ANATOMY AT ST. THOMAS'S HOSPITAL.

LONDON:

B. FELLOWES, LUDGATE STREET.

1831.

Multum egerunt, qui ante nos fuerunt, sed non peregerunt,—multum adhuc restat operis multumque restabit, nec ulli, nato post mille secula, præcluditur occasio aliquid adhuc adjiciendi.—

SENECA.

D4

TO

THE ROYAL BAVARIAN PRIVY COUNSELLOR,

KNIGHT OF THE BAVARIAN ORDER OF CIVIL MERIT,

OF THE RUSSIAN ORDER OF ST. ANN, OF THE SECOND CLASS,

AND OF THE HANOVERIAN GUELPHIC ORDER,

FELLOW OF MANY LEARNED ACADEMIES AND SOCIETIES,

BOTH GERMAN AND FOREIGN,

SAMUEL THOMAS VON SOEMMERRING,

THE

EARNEST AND SUCCESSFUL PURSUER OF

Pathological Anatomy,

AS A

TRIFLING ACKNOWLEDGMENT OF HIS RESPECT

AND OF HIS THANKFULNESS, FOR MUCH INSTRUCTION FROM HIS

WRITINGS, LETTERS, AND ORAL COMMUNICATIONS,

THIS WORK

IS DEDICATED BY

THE AUTHOR.

TRANSLATOR'S PREFACE.

I FEEL no need of apologizing to the Profession for the translation of a work, the value of which I am convinced will be fully appreciated by every reader into whose hands it may chance to come. The importance of the subject on which it treats, the advantage of shewing at one view what has been already done in pathology, and the facility it renders to the student of classing such additional facts as he may meet with in his reading or experience, require no comment; and, as such, I trust it will be found no mean help in professional inquiry.

The additional references given by the author in his Appendix I have incorporated in the body of the work, as he proposed; and to these I have added further references and notices of cases which have come within my own knowledge, all of which are bracketed and marked T. to prevent confusion.

As to the minor share I have borne by the translation, I have to beg the reader's indulgence if, in my endeavour to

render the author's views in, as nearly as possible, his own language, I may seem to have made my translation too literal. Occasionally I have encountered much difficulty in finding suitable expressions; and for one word which the author frequently employs I can find no equivalent, and have been compelled to adopt the term *loosening*, which certainly does not give the full meaning of the term he makes use of, which implies that kind of separation of fibres produced by shaking up a bag of feathers, or by scribbling wool: wherever, therefore, the term *loosening* is used, it must be understood as employed in this sense.

JOHN F. SOUTH.

October 10, 1851.

PREFACE.

My Manual of Pathological Anatomy having been out of print several years, I was anxious to publish a second edition; but I found that, in the meanwhile, there had been not merely a great change in the science about which I purposed writing, but also my own views upon the subject were so much altered, that I rather preferred writing a new book to improving the old one. Hence originates the present work, the first volume of which I recommend to the kind consideration of the honoured reader; and in consequence of having a different publisher, has the new title been employed.

I have but little to say with reference to the plan and arrangement of the book. My own experience, and the advice of well-informed friends, have convinced me that the arrangement commonly employed in Anatomy, would also best suit Pathological Anatomy; but that it was advisable to premise the special pathology by a General Part, which should treat of the irregularities in connexion with each other, which plan I had always hitherto adopted in my Lectures on Pathological Anatomy.

Not forgetting that one principal character of a good book is its brevity, I set out with this view, as much from principle as from inclination, and have endeavoured, wherever explanation was necessary, to supply it in the Notes, to which I must therefore refer in all matters of doubt. A Compendium should, on no account, treat subjects circumstantially, but merely note them; and in lectures, the teacher may very easily spin out, according to his pleasure, the short threads herein provided.

In order that the book might serve for private study and reference, I thought it advisable to add a more copious list

of Pathological Literature. The latter I have arranged, as far as I could, with much time and labour, in a chronological order, so as at once to exhibit, to a certain extent, a history of the science; and the influence which the various prevalent theories in medicine have had in the treatment of the several chapters, will not escape the attentive reader.

I very much regret that the literary notices are not more perfect, but especially the Dutch and Italian, to which I have had no opportunity of referring: be it, however, kindly remembered, that I live on the eastern borders of Germany, and could hardly employ any other than my own single library. Further, I have in part purposely not cited the innumerable isolated observations of the younger practitioners, which have been published in both German and foreign periodicals, as they are often neither interesting nor correct anatomical observations. I have also but rarely employed the copious literary references contained in *Voigtel's* Handbuch der Pathologischen Anatomie, because I found them very unsatisfactory. I have, instead, commonly referred to preparations in the Anatomical Collection at Breslau, which has been done for the sake of my auditors; and the addition to my Catalogue, which will shortly appear, will more fully announce the nine thousand preparations in this collection.

I must, however, observe, that the printing of the work commenced two years ago, but that a severe illness, with an accumulation of official engagements, have prevented its more rapid progress, by which several additions, required to make the work useful, are now added in an Appendix.

The Pathological Anatomy of *Craigie*, *Andral*, and *Lobstein*, unfortunately reached me so late, that I could not make use of them; however, they will certainly be used in the second and last volume, which, I hope, will very soon follow the first.

Breslau, Sept. 1829. A. W. OTTO.

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INTRODUCTION.

ANATOMY, or the science of the structure of organic bodies, is divided into two principal parts, according as it treats either of healthy and regular, or of diseased and irregular structure; the former is briefly called Anatomy, Normal or Physiological Anatomy; the latter, PATHOLOGICAL, MORBID, or PRACTICAL MEDICAL[1] ANATOMY.

The very nature of the subject prevents our setting distinct limits to Pathological Anatomy. For as during life no direct boundary can be drawn between health and disease, so also does the healthy and regular structure of organized bodies merge so imperceptibly and in so many different ways into the diseased and irregular, that normal and abnormal or pathological anatomy cannot be strictly separated from each other, just so intimately and firmly is pathological anatomy connected with pathology, symptomatology, and surgery, that a strict distinction between them might be difficult. In consequence of the close connexion of these sciences with pathological anatomy arises the necessity of making oneself master of them for the purpose of learning and prosecuting it with advantage. But before all, a very intimate knowledge, perfected by practice, not merely of the coarser, but especially of the more delicate structure of organic bodies, that is, a knowledge of human and comparative anatomy, is necessary for the study of pathological anatomy[2].

(1) *Morgagni* præf. ad lib. IV. Epistolar. de sed. et caus. morbor.
(2) *Ib.* præf. ad lib. I.

As, however, man forms but one link in the chain of organic beings, so, for the perfection of pathological anatomy, nothing would operate more advantageously, than the investigation of the diseased structure of the other organic bodies, and particularly those of animals. As soon as we have collected a considerable number of such observations, we may expect, in a general view of the vices of structure in organic bodies, to penetrate deeper into their nature and causes. Even now whilst pathological anatomy, in comparison with most other medical sciences, is only in its infancy, its utility is traced in almost all the branches of medicine; it is the common and absolute source of all,[3] but particularly of anatomy, physiology, and pathology.[4]

Hence is the intimate knowledge of pathological anatomy equally indispensable, both to the practical physician, the medical jurist and the surgeon, and if subsequently this be more studied as a comparative science, for the veterinary physician also.

Pathological anatomy has only in later times been pursued successfully, although in the earliest periods,[5] and some hundred years before GALEN, human bodies had been examined in Egypt[6] in order to ascertain the seat and causes of disease. In the beginning of the sixteenth century, the first work on pathological anatomy was written by ANTONIO BENIVIENI at Florence. When in this century, the love of anatomy revived,

(3) *Morgagni* præf. ad lib. I—V. *Gerh. Andr. Müller* Progr. de utilitate anatomiæ practicæ. Gies. 1753. *Pauls Gräuwen* Oratio de anatomiæ pathologicæ utilitate et necessitate. Groning. 1771.

Ladevéze et *Monfalcon* De l'influence de l'anatomie pathologique sur le progrès de la médecine, etc. in Journ. complém. du Diction. des Sc. médic. T. XI. p. 193—215. T. XIV. p. 289 et T. XV. p. 98. *Bayle* Considérations générales sur les secours que l'anatomie pathologique peut fournir à la Médecine; v. Artic. Anatomie pathologique, in Dict. des Scienc. médicales, T. II. p. 61—78. *Lobstein* in Journ. complémentaire du Dictionnaire des Sciences médicales. Paris, 1818. T. II. p. 3—23.

Bousquet Quelques réflexions sur l'anatomie pathologique, considérée dans ses rapports avec la Science des maladies, in Journ. complém. du Dict. des Sc. médical. T. VII. p. 289—303.

J. Smith D. de utilitate morborum naturam cadaveribus sectis explorandi. Edinb. 1812.

L. Pacini Intorno la necessità dello studio dell' Anatomia patologica. Lucca, 1828.

(4) *F. A. Stürmer* D. exh. meletemata quædam generalia in pathologiam. 8vo. Dorpati, 1814.

OBS.—Not merely local diseases, but fevers and nervous diseases are likewise connected with pathological anatomy, as undoubtedly many of these have organic changes for their cause, and all have them, though perhaps transiently, as an effect.

(5) The Writings of *Hippocrates.*

(6) *Plinius* Nat. Hist. l. XIX. c. 8.

and the science was ardently pursued by FALLOPIUS, VESALIUS, and EUSTACHIUS with most brilliant success; individual observations of interest in pathological anatomy were occasionally made, and pathological examinations were frequently instituted both in this and in the subsequent century. But the deficiency of the necessary ancillary sciences, and the superstition and prejudice at that time prevailing, prevented the speedy progress of this science. BONETUS and MANGETUS, towards the end of the seventeenth century, collected the single, and in some measure, important observations made before their time, and endeavoured to arrange them, though not very successfully. It was only in the eighteenth century that pathological anatomy began to advance rapidly, especially by the extraordinary labour of MORGAGNI, who must be considered as the founder of this science, by the rich and instructive collections of anatomico-pathological preparations of HOVE, RAU, RUYSCH, WALTER VAN DOEVEREN, VATER, WALTER, the MECKELS, the MONROS, the SANDIFORTS, and the HUNTERS, which were further added to by LOBSTEIN, LODER, and others, as well as by the excellent contributions and works of later, and in some instances still living, anatomists.[7]

The pathological anatomy of animals has been relatively, as yet, but little investigated, and needs, as well as comparative pathology, further attention. It arises indeed from the circumstance, that only of late comparative anatomy has began to be studied with ardour; that anatomists and pathologists rarely possess sufficient zoological and zoomedical knowledge, whilst the veterinary physicians, on the other hand, have as rarely sufficient knowledge of physiology and pathology, and further that the rarity of most animals much increases the difficulty of anatomico-pathological examinations. Animals are also subject to much fewer diseases than man living in a civilized state,[8] and those only of them which he appropriates to himself, and about which he evinces the greatest concern, are most frequently subject to diseases.

Besides the numerous and important contributions to pathological anatomy, which are found dispersed in the writings of

(7) A short view of the History of Pathological Anatomy is given by *Morgagni*, præf. ad lib. II. *Hecker* Magazin für die pathol. Anat. and Physiol. Altona, 1796, *Voigtel*, p. 3. and *P. Rayer* Sommaire d'une histoire abrégée de l'Anatomie pathologique. 8vo. Paris, 1818.

(8) *G. E. Stahl* D. de frequentia morborum in corpore humano præ brutis. 4to. 1695.

Don *Bern. Dominguez Rosainz* Porque son mas frequentes las enfermedades en los racionales que en los brutos? &c. Mem. Acad. de la R. Soc. de Sevilla T. V. p. 191. (Why are diseases more common in man than in brutes?)

anatomists, physiologists,[9] and physicians, the best general works, either exclusively or preeminently, relating to pathological anatomy, are the following:[10]

Anton. Benivenius De abditis nonnullis ac mirandis morborum et sanationum causis. 4to. Florent. 1507.

*Jo. Jacob Chiffletius, Singulares tam ex curationibus quam Cadaverum sectionibus observationes. 12mo. Paris, 1612.

*T. Corbeus Pathologia sive Morborum et Affectuum omnium præter naturam qui Corpus Humanum invadere solent enumeratio. 12mo. Francof. 1616.

*J. Riolanus, (filius) Encheiridium Anatomicum et Pathologicum in quo ex naturali Constitutione Partium Recessus à naturali Statu demonstratur. 8vo. Lugd. Batav. 1649.

*Gualt. Charleton, M.D. Exercitationes Pathologicæ novis Anatomicorum inventis sedulo inquiruntur. 4to. London. 1661.

Th. Kerckringii Spicilegium anatomicum, continens observationum anatomicarum rariarum centuriam unam, etc. 4to. Amstel. 1670.

Th. Bartholinus De anatom. practica ex cadaveribus morbosis adornanda consilium. 4to. Hafniæ, 1674.

Theophili Boneti Prodromus anatomiæ practicæ. 8vo. Genevæ, 1675.

Ejusd. Sepulchretum anatomicum s. anatomia practica ex cadaveribus morbo denatis. Vol. II. fol. Genev. 1679. Mangeti, Vol. III. fol. Lugdun. 1700.

Gregorii Horstii Specimen anatomiæ practicæ. Francof. 1678.

Steph. Blancardi Anatomia practica rationalis, s. rariorum cadaverum morbis denatorum anatomica inspectio. 12mo. Amstel. 1688.

*Jac. Am. Long, D. de Differentia inter Hominum morbos com brutis communes. 4to. Alt. 1689.

Bibliotheca anatomica illustrata et aucta. Digesserunt Daniel Clericus et J. J. Mangetus. Vol. II. fol. Genev. 1699.

H. Bidloo Exercitationum anatomico-chirurgicarum Decades duæ. 4to. c. tab. Lugd. B. 1708.

Jo. Salzmanni Specimen anatomiæ curiosæ et utilis. 4to. Argent. 1709.

(9) Viz. *Haller, Blumenbach, J. Hunter, Pinel, Bichat,* and many others.

(10) Compare *Baldinger* Neues Magazin für Aerzte, Leipzig, 1799. Vol. IX. Part I. p. 87, and Vol. XVI. Part VI. p. 481. *Hecker,* The Manuals of *Ludwig, Conradi, Voigtel,* and *Consbruch,* as well as *Heusinger* System der Histologie, Vol. I. Part I. p. 50—103.

* All the authorities marked thus * are additional.—*Translator.*

Jo. Mauritii Hoffmanni Disquisitio corporis humani anatomico-pathologica rationibus et observationibus veterum et recentiorum singulari studio collectis, confirmata. 4to. Altdorf. 1713.

Ph. Conr. Fabrizii Idea anatomiæ practicæ. 8vo. Wetzlar, 1741.

F. Barrère Observations anatomiques tirées de l'ouverture des cadavres. 4to. Perpignan, 1751. 2d ed. enlarged, with engravings. 4to. 1753.

*C. N. Jenty, M. D. A Course of Anatomico-Physiological Lectures on the Human Structure and Animal Œconomy, &c. and Pathological Observations, deduced from the Dissection of Morbid Bodies. Including whatever is most valuable in the Works of all the eminent Professors on these subjects. 3 vols. 8vo. London, 1751—65.

Albini Variæ annotationes anatomico-pathologicæ in Lambrecht's Oblectationes et observationes anatomicæ. Francof. 1751.

J. D. Metzger Observationes nonnullæ anatomico-pathologicæ c. Epicrisi. Regiom. 1757.

Pet. Camper Demonstrationes anatomico-pathologicæ. fol. Lib. I. et II. Amstelod. 1760—62.

Jo. Baptistæ Morgagni De sedibus et causis morborum per anatomen indagatis. Vol. II. fol. Venet. 1761. — fol. Patav. 1767. — Vol. II. 4to. Amstel. 1768. — Ebroduni in Helvet. ex edit. Tissoti, 1799. Vol. III. 4to. Translated into German by Koenigsdoerfer. 5 vols. 8vo. Altenb. 1771. Edid. J. Radius. Lips. 1828.

*Samuel Clossy, Of some Diseases of the parts of the Human Body, chiefly taken from the Dissections of Morbid Bodies. 8vo. London. 1763.

Alb. v. Haller Opera minora. 4to. Laus. 1762—68. Vol. III. and Opuscula pathologica. 8vo. Laus. 1768.

Rich. Browne Cheston, Pathological Inquiries and Observations in Surgery from the dissection of morbid bodies. 4to. Glocester, 1766. Pathologische Untersuchungen und Beobachtungen in d. W. A. K. durch Zergliederung krankhafter Leichname; nebst einem Anhange von 12 versch. Wahrnehmungen v. J. C. F. Scherf. 8vo. Gotha, 1780.

Joh. Lieutaud Historia anatomico-medica, sistens numerosissima cadaverum humanorum extispicia, quibus in apricum venit genuina morborum sedes. Edit. ab Ant. Portal. Vol. II. 4to. Paris, 1767. recudi curavit, correxit et suppl. complet. J. Chr. Fr. Schlegel. Vol. II. 8vo. maj. Longosaliss. 1786—87.

Ed. Sandifort Observationes anatomico-pathologicæ. Vol. IV. c. fig. 4to. Lugd. B. 1777—80.

Chr. Fr. Ludwigii Primæ lineæ anatomiæ pathologicæ. 8vo. Lips. 1785.

Vicq d'Azyr Artic. Anatomie pathologique, in the Encyclopédie méthodique. 1789.

Chr. Fr. Ludwigii De quarundam ægritudinum h. c. sedibus et causis, tabulis 16, meditat. nonn. illustr. fol. Lips. 1798.

Matthew Baillie, The morbid anatomy of some of the most important parts of the Human Body. 8vo. 5th edition. London, 1818. Translated from the 1st edition into German, with additions, by S. Th. Soemmerring. 8vo. Berlin, 1794. and the Appendix, with the 5th edition, translated by Dr. C. Hohnbaum, and with additional remarks by S. Th. v. Soemmerring. 8vo. Berlin, 1820. —translated also into Italian by Zannini, and into French by Guerbois.

Ib. Series of Engravings, accompanied with Explanations, which are intended to illustrate the morbid anatomy of some of the most important parts of the human body. 2d ed. 4to. London, 1812.

Ib. The morbid anatomy and other works of the late, by J. Wardrop. 2 vols. 8vo. Lond. 1827.

Georg. Christoph Conradi Handbuch der pathologischen Anatomie. 8vo. Hannov. 1799.

J. C. Flachsland Observationes anatomico-pathologicæ. Rastad. 1800. c. tab. æn.

Spry Ueber die Anatomie des kranken Körpers v. Friese Annalen der neusten britt. A. K. u. W. A. K. Bd. I. St. I. 1801.

C. Bell, A System of Dissection, explaining the anatomy of the human body, the manner of displaying the parts, and their varieties in disease. fol. Edinb. 1798.

**Ib.* Engravings of specimens of morbid parts in the Author's collection. fol. London, 1813.

V. Malacarne Ricordi della Anatomia chirurgica raccolti. 2 tom. 8vo. Padova, 1801—2.

G. Dupuytren Propositions sur quelques points d'anatomie, de physiologie et d'anatomie pathologique. Paris, 1803.

A. R. Vetter Aphorismen aus der pathologischen Anatomie. Wien. 1803.

G. H. Thilow Beschreibung anatomisch-pathologischen Gegenstände durch Wachspräparate und Kupfer versinnlicht, nebst verschiedenen Anmerkungen. Bd. I. L. I. Gotha, 1804.

Prost Médecine éclairée par l'observation et l'ouverture des corps. 2 tom. 8vo. Paris, 1804.

Portal Cours d'Anatomie médicale, ou élémens de l'anatomie de l'homme avec des remarques physiologiques et les resultats des observations sur le siège et la nature des maladies d'après l'ouverture des Corps. 5 tom. 8vo. Paris, 1804.

F. G. Voigtel Handbuch der pathologischen Anatomie. Mit Zusätzen von P. F. Meckel. 3 bde. 8vo. Halle, 1804—5.

C. J. Kellethout Sectiones cadaverum pathologicæ. Lugd. Batav. 1805.

Flor. Caldani Osservazioni anatomico-patologiche. Memoria I. in Memor. di Matemat. e di Fisica della Societ. Italian. T. XII. P. II. Modena, 1806.

Ph. Fr. Meckel Journal für anatomische Varietäten, feinere und pathologische Anatomie. 8vo. Bd. I. H. I. m. k. Halle, 1805.

*F. I. V. Broussais Histoire des Phlegmasies ou inflammations chroniques. 2 tom. 8vo. Paris, 1808—1816.

Joh. Fr. Meckel Handbuch der pathologischen Anatomie, Bd. I. Bd. II. Abth. 1 und 2. 8vo. Leipzig, 1812—18.

J. M. D. Herold D. exh. Observata quædam ad corp. hum. partium structuram et conditionem abnormem. 8vo. Marburg. 1812.

Alex. Monro, jun. Outlines of the Anatomy of the Human Body in its sound and diseased state. 8vo. Edin. 1812. 3 vols. and 1 vol. engravings.

Joh. Fr. Blumenbach De anomalis et vitiosis quibusam nisus formativi aberrationibus commentatio. 4to. c. duob. tab. æn. Gotting. 1813.

*Kelch Beiträge zur patholog. Anatomie. Berl. 1813.

J. Farre, Pathological Researches in Medicine and Surgery. 8vo. London, 1814.

A. F. Fowe D. s. animadversiones in anatomiam pathologicam. 8vo. Berol. 1815.

Gottfr. Fleischmann Leichenöffnungen. 8vo. Erlangen, 1815.

*J. W. Francis, M.D. Cases of Morbid Anatomy. 4to. New York, 1815.

C. H. Parry, Elements of Pathology and Therapeutics, illustrated by numerous Cases and Dissections. Vol. I. 8vo. Lond. 1816.

Jean Cruveilhier Essai sur l'Anatomie pathologique en général et sur les transformations et productions organiques en particulier. 2 tom. 8vo. Paris, 1816.

Ib. Médecine éclairée par l'Anatomie et la Physiologie pathologique. 8vo. Cah. I. Paris, 1821.

Ib. Anatomie pathologique du corps humain, ou descriptions avec figures lithographiées des diverses altérations morbides, dont le corps humain est susceptible. fol. Liv. I. to X. Paris, 1828—1831.

A. W. Otto Seltene Beobachtungen zur Anatomie, Physiologie und Pathologie gehörig. 4to. m. k. 1tes. Heft. Breslau, 1816,

2tes Heft. Berlin, 1824. (Also under the title, Neue seltene Beobacht.)

John Howship, Practical Observations in Surgery and Morbid Anatomy illustrated by cases, with Dissections and Engravings. 8vo. Lond. 1816. Translated into German by Schulze. 8vo. Halberst. 1819.

J. F. Meckel Tabulæ anatomico-pathologicæ, modos omnes, quibus partium corp. hum. forma externa atque interna a norma recedit, exhibentes. fol. Fasc. I.—IV. Lips. 1817—26.

Rob. Allan, A System of pathological and operative Surgery, founded on Anatomy, illustrated by Drawings of diseased Structure and Plans of Operations. 3 vols. 8vo. Edinburgh, 1819—24.

J. B. Palletta Exercitationes pathologicæ. c. tab. æn. 4to. maj. Mediol. 1820. P. II. Mediolani, 1827.

Consbruch's Taschenbuch der pathologischen Anatomie für praktische Aerzte und Wundärzte. 8vo. Leipz. 1820.

P. J. Wassermann D. de mutationibus pathologicis primitivarum in organismo humano formationum. 8vo. Padua, 1820. v. Dissertazioni inaugurali d'argomento medico-clinico publicate nell' J. R. Università di Padova. 8vo. Padova, 1821.

Fr. Nasse Leichenöffnungen, 1te Reihe. 8vo. Bonn, 1821.

L. Cerutti Pathologisch-anatomisches Museum, enthaltend eine Darstellung der vorzüglichsten krankhaften Veränderungen und Bildungsfehler der Organe des menschlichen Körpers u. s. w. Bd. I. Heft I. und II. 4to. Leipz. 1821—24.

H. F. Jsenflamm Anatomische Untersuchungen. 8vo. Erlang. 1822.

Tacheron Recherches anatomico-pathologiques sur la Médecine pratique, etc. 3 tom. 8vo. Paris, 1823.

Poilroux Nouvelles Recherches sur les maladies chroniques et principalement sur les affections organiques et les maladies héréditaires. 8vo. Paris, 1823.

Xav. Bichat Anatomie pathologique, ed. par Boisseau. 8vo. Paris, 1825. Translated into German, with Notes, by Pestel. 8vo. Leipz. 1826.

Heusinger Berichte von der Königl. anthropotomischen Anstalt uz Würzburg. 1ter Bericht. 4to. m. k. Würzburg, 1826.

Louis Memoires, ou Recherches anatomico-pathologiques. 8vo. Paris, 1826.

Repertoire général d'anatomie et de physiologie pathologiques et clinique chirurgicale, ou Recueil de mémoires et d'observations sur la chirurgie et sur l'anatomie et la physiologie considerées dans les tissus sains et les tissus malades. 8 tom. 4to. with lithog. plates. Paris, 1826. An almost complete system of Pathological Anatomy is

given in three Essays, by MERAT, in Diction. de Scienc. médicales: Lésions organiques, Vol. XXVII. p. 485; Lésions physiques des organes, Vol. XXXVIII. p. 138; and Lésions organiques des tissus, Vol. LV. p. 210.

LAENNEC Note sur l'anatomie pathologique in Journ. de Médec. Chir. et Pharm. par CORVISART, LEROUX, etc. T. IX. p. 360, and his Essay, Anatomie pathologique in Diction. des Sc. médic. Vol. II. p. 46.

SPITTA Die Leichenöffnung in Beziehung auf Pathologie u. Diagnostik. Stendal, 1826.

BERARD D. sur plusieurs points d'Anatomie pathologique. Paris, 1826.

RIBES De l'anatomie pathologique considerée dans ses vrais rapports avec la science des maladies. T. I. 8vo. Paris, 1828.

*L. C. ROCHE and L. I. SANSON Nouveaux Elemens de Pathologie Medico Chirurgicale. 5 vols. 8vo. Paris, 1828.

CRAIGIE, Elements of general and pathological Anatomy adapted to the present State of Knowledge in that Science. 8vo. Edinb. 1828.

R. BRIGHT, Reports of Medical Cases, selected with a view of illustrating the Symptoms and Cure of Diseases by a reference to morbid Anatomy. 4to. with 16 coloured engravings. London, 1827.

J. R. FARRE, Journal of morbid Anatomy, or Researches, etc. London. Vol. I. 4to. with engravings. 1828.

BARON, Delineations of the Origin and Progress of various Changes of Structure which occur in Man and some of the inferior Animals, etc. 4to. with engravings. London, 1828.

G. ANDRAL Precis d'Anatomie pathologique. 3 tom. 8vo. Paris, 1829.

J. F. LOBSTEIN Traité d'Anatomie pathologique. T. I. Paris, 1829.

*W. MONEY, A Vade-Mecum of Morbid Anatomy. 8vo. London, 1831.

*CLOCQUET Pathologie Chirurgicale. Plan et Méthode qu'il convient de suivre dans l'enseignement de cette science. 4to. Paris, 1831.

Descriptions of Anatomical Collections which are of importance to Pathological Anatomy.

RUYSCHII Thesaurus anatomicus I.—X. 4to. c. fig. æn. Amstelod. 1701—16.

Ejusd. Curæ posteriores seu Thesaurus omnium maximus.

8vo. Amstelod. 1724. Curæ renovatæ, etc. 4to. Amstel. 1728. (in operibus.)

Vateri Museum anatomicum proprium. 4to. c. tab. æn. Helmst. 1750.

Ed. Sandifort Museum anatomicum Academiæ Lugduno-Batav. T. I. with 9 plates. T. II. with 127 plates. fol. Lugd. Bat. 1793.

Koehler Beschreibung der physiologischen und pathologischen Präparate, welche in der Sammlung des Herrn Hofrath Loder enthalten sind. 8vo. Abth. I. Jena 1794.

Museum anatomicum Boltenianum. 8vo. Hamb. 1796.

J. G. Walters Anatomisches Museum, beschrieben von F. A. Walter. 2 thl. 4to. with plates. Berlin, 1796.

Ejusd. Museum anatomicum, etc. venale offert. 8vo. Berol. 1802.

Ejusd. Museum anatomicum, etc. 4to. Berolini, 1805.

F. B. Osiander Epigrammata in complures Musei anatomici res. 8vo. Gotting. 1807. *Ib.* enlarged. 1814.

Biermayer Museum anatomico-pathologicum Nosocomii universalis Vindobonensis. 8vo. Vindob. 1816.

Catalogue of the Museum of Heaviside. London, 1818.

Burdach Berichte von der Königl. anatomischen Anstalt zu Königsberg. 1ter bis 6ter Bericht. 8vo. Leipzig, 1818—1823.

Seidel Index Musei anatomici Kiliensis. Kîliæ, 1818.

Cerutti Beschreibung der pathologischen Präparate des anatomischen Theaters zu Leipzig. 8vo. Leipzig, 1819.

Fanzago Memorie sopra alcuni pezzi morbosi conservati nel gabinetto patologico dell' J. R. Università di Padova. 4to. with engravings. Padova, 1820.

Lobstein Compte rendu à la Faculté de Médecine de Strasbourg sur l'état actuel de son Museum anatomique, suivi du catalogue des objets qu'il renferme. 8vo. Strasbourg, 1820.

Ejusd. Compte rendu etc. sur les travaux anatomiques exécutés à l'amphithéatre pendant les années 1821—1823. 8vo. Strasbourg, 1824.

Loder Index præparatorum, aliarumque rerum ad anatomen spectantium, quæ in Museo Univ. Mosquensis servantur. 8vo. Mosquæ, 1823. Edit. altera emendata et aucta. Mosquæ, 1826.

A. K. Hesselbach Beschreibung der pathologischen Präparate, welche in der Königl. anatomischen Anstalt zu Würzburg aufbewahrt werden. 8vo. Giessen, 1824.

A. W. Otto Verzeichniss der anatomischen Präparaten sammlung des Königl. Anatomie-Instituts zu Breslau. 8vo. Breslau, 1826.

Bleuland Descriptio Musei anatomici academiæ Rheno-Trajectinæ. 4to. maj. Traj. ad Rhen. 1826.

Ib. Icones anatomico-pathologicæ partium corporis humani, quæ in descriptione Musei Acad. Rheno-Trajectinæ inveniuntur. 4to. Fasc. I. & II. Traj. ad Rh. 1827.

Sandifort Museum anatomicum academiæ Lugduno-Batavæ. Vol. III. descriptum a Ger. Sandifort. fol. Lugd. Batav. 1827.

*J. Lasky, General Account of the Hunterian Museum, Glasgow. 8vo. Glasgow, 1813.

*Catalogue of the Hunterian Collection in the Museum of the Royal College of Surgeons in London. 4to. Parts I. to V. London, 1830—31.

*Thomas Hodgkin, M. D. A Catalogue of the Preparations in the Anatomical Museum of Guy's Hospital. 8vo. London, 1830.

Principal Works on the Pathological Anatomy of the Lower Animals.

*M. Paulet Recherches Historiques et Physiques sur les Maladies Epizootiques. 2 vols. 8vo. Paris, 1775.

*C. Bougelat Memoires sur les Maladies contagieuses de Betail. 4to. Paris, 1776.

*James Clark, First Lines of Veterinary Physiology and Pathology, 1 vol. 8vo. Edin. 1788—1806.

A. G. Camper's Abhandlung von den Krankheiten, die sowohl den Menschen als Thieren eigen sind. Deutsch von Herbell. 2te aufl. 8vo. Lingen, 1794.

E. L. W. Nebel De nosologia brutorum cum hominum morbis comparata. 8vo. Giessæ, 1798.

*D. Blaine, Anatomy of the Horse, accompanied with Remarks, Physiological, Pathological, Chirurgical, and Natural. Illustrated with tables. 8vo. London, 1799.

**Ib.* Canine Pathology. 8vo. London, 1800—1817.

**Ib.* The Outlines of the Veterinary Art; or, the Principles of Medicine, as applied to a Knowledge of the Structure, Functions, and Economy, of the Horse, the Ox, the Sheep, and the Dog, and to a more scientific and successful Manner of treating their various Diseases. 2 vols. 8vo. London, 1802—1816.

*D. Blaine, A Domestic Treatise on the Diseases of Horses and Dogs. 12mo. London, 1803—1810.

Bergmann D. s. primas lineas pathologiæ comparatæ. 8vo. Gotting. 1804.

C. A. Rudolphi Bemerkungen aus dem Gebiet der Naturgeschichte, Medizin und Thierarzneikunde, auf einer Reise durch einen Theil von Deutschland, Holland und Frankreich gesammelt. 2 thle. 8vo. Berlin, 1804-5.

*Temminck Histoire Naturelle Générale des Pigeons et des Gallinaces. 3 vols. 8vo. with plates. Amsterdam, 1813.

*Reich Belekung fur den Landman über die Rindviel seuche. 1814.

*J. R. Johnson, Treatise on the Medicinal Leech, with Remarks upon the Diseases, &c. of Leeches. 8vo. London, 1816.

*Further Observations, &c. 8vo. London.

*M. Dupuy De l'affection tuberculeuse, vulgarement appelée Morve Pulmonie, Gourme, Farcin, Fausse Gourme, Pommelière, Phthisie du Singe, du Chat, du Chien, et des Oiseaux domestiques, comparée à l'affection hydatideuse, ou pourriture, du Mouton, du Lapin, du Lièvre, et à la ladrerie du Cochon. 8vo. Paris, 1817.

Gandolphi Cenni di confronto tra le malattie dell' Uomo e dei Brutti in Opusc. scientif. Tom. I. Fasc. VI. 4to. p. 357—372. Bologna, 1817.

K. E. Schwab Materialien zu einer pathologischen Anatomie der Hausthiere. 1ter Bericht. 8vo. München, 1817.

Mundigl Comparativ physiol. und nosolog. Ansichten von den Krankheiten des Menschen und der vorzüglichsten Hausthiere u. s. w. 8vo. München, 1818.

Greve Erfahrungen und Beobachtungen über die Krankheiten der Hausthiere im Vergleich mit den Krankheiten der Menschen. Bd. I. und II. Oldenburg, 1818—21.

*W. Percival, Elementary Lectures on the Veterinary Art. 3 vols. 8vo. London, 1823.

O. J. W. Remer D. exh. Pathologiæ comparatæ Specimen. 8vo. Vratisl. 1825.

*H. Bürger Die veterinair Diagnostik oder die Kunst, die innern und aussern Krankheiten unserer Hausthiere zu erkennen und von einander zu unterscheiden. fol. Berlin, 1830.

*Flourens Sur quelques Maladies des Oiseaux, in the Memoires de l'Acad. Royale des Sciences. Tom. X. p. 607, for 1831.

FIRST,

OR

GENERAL PART.

FIRST SECTION.

Of the Vices of Animal Organization in general.

§ 1.

THE essence of all deviation from the healthy organic condition of animal bodies, is either the DISTURBANCE OF THEIR NORMAL NUTRITIVE ACTIVITY IN QUANTITY OR QUALITY, or the MECHANICAL SEPARATION OF THE NATURAL CONNEXION OF THEIR PARTS, whence again are necessarily produced changes of the nutritive activity.

§ 2.

The Vices of both kinds must, if they can be generally recognised, relate to the sensible physical peculiarities of animal bodies, viz. to NUMBER, SIZE, FORM, POSITION, CONNEXION, COLOUR, CONSISTENCE, CONTINUITY, TEXTURE, and CONTENTS, according to which we shall therefore consider them. The chemical peculiarities naturally belong to pathological chemistry, on which account, pathological anatomy excludes generally from its sphere the animal fluids, and only concerns itself incidentally with the more important fluids, in reference to their quantity, colour, and consistence.

§ 3.

Very rarely is a part of the body found deficient only in one of the above-mentioned physical properties—but very commonly in several at the same time, which often act alternately as cause

and effect. Thus, for instance, vices of form and position, not unfrequently produce those of texture, colour, consistence, &c., nay, by stoppage of the juices, give rise to coagulations and formations of extraneous bodies; more frequently the morbid texture of a part induces a change also of form, size, and position.

§ 4.

According to the PERIOD, at which vices of the animal organization occur, are they distinguished into the CONGENITAL, *vitia congenita*, and those at a period subsequent to birth, the ACQUIRED, *vitia acquisita;*[1] the former are for the most part vices of form and position, whereas the latter, because they occur at a period, in which the proportional size of the part is more or less perfectly completed, seem to refer more to the texture of the part.

(1) This division is of little value, as the period of its origin is less important, than the cause and nature of the vice; and at a later period the two kinds are often not at all to be distinguished. Still the Congenital Vices are often more closely connected with the life of the whole, and are more difficult to cure than the Acquired Vices; for example—coalescence of the fingers.

§ 5.

According to their CAUSAL RELATIONS, are all organic vices ORIGINAL MALFORMATIONS, *vitia primæ conformationis,*[1] that is, arising out of a variation of the formative impulse, in the first stage of the animal organism, or of that of its single parts; or they are produced by MECHANICAL CAUSES, LESIONS and WOUNDS, *læsiones et vulnera;* or finally, they are occasioned by DISEASES, LOCAL or ORGANIC, *morbi locales*, DISORGANIZATIONS, &c.

(1) *J. Fr. Blumenbachii* De anomalis et vitiosis quibusdam nisus formativi aberrationibus commentatio. 4to. with plates. Götting. 1813. 8vo. Leyden, 1824.—*Suringar* D. de nisu formativo ejusque erroribus.

§ 6.

Such MALFORMATIONS, if they be trifling and not injurious to the individual in which they occur, we call SPORTS of NATURE, *lusus naturæ,*[1] or VARIETIES of FORMATION, *varietates;* if they mar the external appearance, DEFORMITIES, *deformitates, turpidines;*—if they be strange, considerable, and striking, we name them MONSTROSITIES, *monstrositates*, and the individual so circumstanced a MONSTER, *monstrum*—finally, such malformations as are so merely at a later period of life, whilst at an early period they belong to the normal form, which arise as it were out of a staying, at an early stage of

formation, of the gradual development of the whole body or of a part of it, and consequently are incomplete developments, are called RETARDED FORMATIONS, *evolutiones retardatæ.*[2] These are usually congenital, they may however occur also at a later period. To the RETARDED FORMATIONS belong for the most part the distant resemblances which human monsters sometimes bear to animals; however, on closer comparison, the supposed resemblances greatly disappear, or are merely accidental, occurring always with reference to single parts alone and with great difference in the remaining parts. Still less has the brute monster any real resemblance[3] to the higher form of man; we can always distinguish in each monster, by a more exact examination, the class, kind, and species to which the malformed animal belongs; and the same laws of formation which prevail in the normal series of animals, are active in the abnormal, prevent an endless deviation,[4] and are the ground of the great resemblance of many monsters.

(1) *Timmermann* D. de notandis circa naturæ lusus in machina humana. 4to. Rintel. 1765.—*Jnsfeldt* D. de lusibus naturæ. 4to. L. B. 1772. *Ottens* D. de lusibus naturæ naturam illustrantibus. Harderov. 1799. [*Fortun. Liceto* De monstrorum natura, causis et differentiis. Libri duo, with engravings. 4to. Patav. 1634.—*J. Hofer* Observ. Monst. human. in Acta Helvet. Vol. III. p. 373. 4to. Basil, 1751—1767.—*Vinc Malacarne* De'Mostri Umani, de caratteri fondamentali su cui se ne potrebbe stabilire la classificazione, e delle Indicazione che presentano nel Parto 4to.—*Ib.* Osservazioni anatomiche in conferma d'una proposizione circa l'origine de'Mostri. 4to. Modena, 1805. —*J. M. de la Sarthe* Description des principales Monstruosités dans l'homme et dans les animaux précédée d'un discours sur la physiologie et la classification des Monstres, with coloured engravings. fol. Paris, 1808.]

(2) *Harvey* De generatione. Amstel. 1662. p. 300.—*Wolff* in N. Comm. Petrop. T. XVII.—*Reil* Archiv f. die Physiol. Vol. IX. p. 63, 64.—*Meckel* Handbuch der pathologischen anatomie, Vol. I. p. 48—61.—*Mansfeld* in *Meckel's* Archiv f. Anat. und Phisiol. 1826. No. I. p. 96. *von Walther* in his and *Graefe's* Journal f. Chir. Vol. II. p. 4.

(3) *Blumenbach,* p. 6.

(4) *S. Th. v. Sömmerring* Abbildungen und Beschreibungen einiger Missgeburten, etc. fol. Mainz, 1791. p. 38. § 91.—*Geoffroy-Saint-Hilaire* Philosophie anatomique, T. II. des monstruosités humaines. 8vo. Paris, 1822. p. 101.

§ 7.

No class of animals is free from malformations, lesions, and disorganizations; but each of them, and frequently even single orders, families, and kinds, are very differently affected by them according to the peculiarities of their organization, kind of life, &c. There are malformations and organic diseases which belong only to certain kinds,[1] or are particularly frequent in them.[2] It sometimes even happens that the morbid direction of the formative impulse, accidentally excited in the parents, is so permanent and innate, that several young born at the same time are similarly malformed,[3] or that the young of several

successive births are subjected to similar malformations or disorganizations.[4] Mechanical causes affecting the mother, can also produce a change in several of the children subsequently born.[5]

(1) *J. Hunter*, Observations on certain parts of the Animal Economy. 2d edition. 4to. London, 1792. p. 75.

The siren-formation and cancer are peculiar to man;—to cats, the elongation of the hind feet, with contemporaneous shortening of the tail;—to cattle, the upward curvature of the ribs;—to snails, the inverted winding and separation of their volutes (cornu copiæ) &c.

(2) For instance, the proboscis in cyclopic swine, the supernumerary feet in cattle, the shortening of the face in carp, &c.;—ruptures in man; inflammation, dropsies more frequent in one kind than another.

(3) For example, two children with hydrencephalus and curvature of the extremities. v. *Walter* Museum anatomicum, 4to. 1805, p. 123, No. 818.—Four dogs, with defective fore feet and with the hare fissure (hare lip). v. *Aucante* in *Roux's* Journal de Médecine, Vol. XXXII. p. 14.—Two monstrous swine in the Breslau Museum, No. 2981 and 2982.—Three rattle snakes, with double heads. v. *Mitchell* in the American Journal of Science and Arts, 1825, Oct. p. 48. All ten pigs of one sow were littered without eyes, in the neighbourhood of Breslau.

(4) *Meckel* has collected many cases, Handb. der pathol. anat. Vol. I. p. 15. Three brothers and sisters with shortening of the right thigh. v. *Schreger* Chir. versusche, Vol. II.—Three brothers and sisters with deficient brain. v. *Penada* Saggio d'osservazioni e memorie, etc. Padua, 1793.—Seven children of the same parents were affected with hydrencephalus. v. *Rolph* in London Medic. Reposit. Sept. 1824.—Four brothers and sisters died of cancer of the eye. v. *Lerche* in Verm. Abhandl. a. d. G. d. Heilk. von einer Gesell. prakt. Aerzte, Petersb. Part I. 1821, No. 14.—I know a case of three brothers and sisters without an eye-ball, and another case of umbilical rupture in several brothers and sisters.

(5) A woman who had in the back part of the pelvis a pointed bony tumour, bore four children, each of whom had a deep indentation, and an unossified spot on the forehead. v. *Frank* in *Textor's* Neuem Chiron. Vol. I. Part II. p. 261.

§ 8.

Very frequently is the irregular form transmitted from the parents to their children and grandchildren,[1] and even becomes permanently hereditary; even the more peculiar Vices of the parents, whether Congenital, or Acquired from disease, are sometimes inherited for many generations;[2] we find this especially the case with reference to the extremities,[3] and it gives rise in brutes to particular varieties.[4] Even intentional dismemberments may easily become hereditary.[5]

(1) For example, the habitus apoplecticus and phthisicus.

(2) To wit, the thick joints of rickety parents, fissured nose in dogs, an exostosis on the head of a bull. v. *Rudolphi's* Bemerkungen aus d. Geb. d. Naturgesch. u. s. w. 8vo. Berlin, 1804, Vol. I. p. 75.—The goitre, wolf's and hare lip. v. *Trew.* N. Act. N. C. I. p. 445, and *Amia* in *Hartenkeil's* Med. chir. Zeitung, 1805, Vol. IV. p. 212;—the hypospady, or termination of the urethra beneath the glans penis. v. *Heuermann* med. Beob. Vol. II. p. 234, &c.

(3) For example, six fingers and toes, or junction of them, occur in whole families; the short great toe is hereditary in all of us; further, club-feet, spavin, capped heels, diseased hoofs; for some instances in man, v. *Otto* Selt. Beob. Part I. No. 22, p. 60.

(4) In the American short-legged sheep, in swine with one hoof and with three, dogs with wolf's claws, fowls with five or six toes.

(5) For instance, in man, the circumcised prepuce; in dogs and horses, the shortened ears and tails. [To this belong the crooked-tailed cats, of which an account is given by *G. Bennett,* in London Med. Gazette, Vol. VIII. p. 332. 1831, On a peculiar formation of the tail in the Malay and Manilla cats. T.]

§ 9.

The disposition towards this or that kind of irregularity also varies according to the difference of SEX, AGE, CLIMATE, MODE OF LIVING, &c. The FEMALE BODY, for instance, is more subject to malformations, softening of the bones, spurious formations, especially fatty tumours, cancer, femoral rupture, &c. than the MALE BODY, which, on the other hand, is more frequently affected with aneurysms, inguinal ruptures, and, on account of the mode of living, with mechanical lesions. Each AGE, CLIMATE, and OCCUPATION has its peculiar diseases[1] which often alter the organization. Domestic animals are also more frequently subject to pathological states than the wild of the same species; viz. to malformations which are the more common, the more artificially the animals are influenced by man.[2] Still the reason why our domestic animals produce monsters in so much greater proportion than others, appears to rest either on the particular operation of man upon certain animals, or on their particular condition.[3] Even the artificial hatching of eggs is said frequently to produce deformed chickens.[4]

(1) Almost all foreign animals which have died in menageries, have presented to me the appearance of scrofula, diseases of bone, and a morbid state of the viscera. [*A. Wilson,* M. D. Some Observations relating to the influence of climate on vegetables and animal bodies. 8vo. London. 1780.—*M. Roulin,* M.D. Inquiries respecting certain changes observed to have taken place in domestic animals transported from the old to the new world, in *Jamieson's* Journal, new series. Vol. VII. p. 326. 8vo. Edinb. T.]

(2) Among beasts, in the domestic animals of this class; among birds, in the domestic fowls and pet birds; and among fishes, in the carp and gold fish. [*F. Cuvier,* on the domestication of mammiferous animals, in *Jamieson's* Journal, new ser. Vol. IV. p. 60, 292. 8vo. Edinb. T.]

(3) For example, oxen and sheep, much more commonly than swine, goats, and particularly horses; cats more frequently than dogs, &c.

(4) With deficient limbs. v. *Shaw,* On the nature and treatment of the distortions to which the Spine, &c. 8vo. p. 39. London. 1823.—*Gerson* and *Julius* Magaz. d. ausländ. Lit. d. ges. Heilk. 1824. Iuli u. Aug. p. 91.—*Geoffroy-Saint-Hilaire* in Memoirs du Museum d'Hist. nat. Vol. XIII.

§ 10.

Finally, PARTICULAR REGIONS and PARTS of the animal body present great variety in the proportionate frequency of their congenital or acquired vices. The left side, usually the weaker, although not from malformation, is however affected by organic disease more frequently than the right;[1] the right

half of the brain alone makes an exception to this rule, in consequence of the stronger flow of blood through it.[2] The irregularly increased number of parts is more common in the upper half of the body; on the contrary, in the lower, consolidation is most frequent. The upper extremities are more subject to variety in the blood-vessels; the lower extremities more to diseases, to wit, ulceration. Those organs which are situated nearest to the heart are subject to many diseases, on account of the strong circulation in them; whilst those farther distant are disposed to other diseases, depending on a weaker circulation. Finally, the heart, the blood-vessels, the digestive, urinary, and sexual organs, are more frequently subject to vicious formations than the nervous system, the organs of sense, of respiration, &c.[3]

(1) *Du Pui* Diss. de homine dextro et sinistro, Lugd. Batav. 1780, reprinted in *Schlegel's* Thes. pathol. therap. Fasc. I. No. 1.—*Monteggia* De morbis symmetricis et asymmetricis in Fasc. pathologicis, No. 1. Mediol. 1789.—*Courmette* in the Journ. de Médecine, p. 85.—*Isenflamm* in his and *Rosenmüller's* Beitr. f. die Zergliederungskunst, Vol. I. Part I. No. 2.—*Osiander* in Abhandl. der phys. med. Soc. zu Erlangen, Vol. I. p. 331.—*Ardieu* Considérat. anat. et physiol. sur la ligne mediane, qui divise le corps en deux moitiés symmetriques. Strasb. 1812.—*Mehlis* Comment. de morbis hominis dextri et sinistri. 4to. Gött. 1818.—*Hemsing* D. de privilegio lateris dextri in corpore humano. Groening. 1822.—*Kopp* Ueber die Verschiedenheit zwischen der rechten und linken Seite beim Menschen, besonders im krankhaften Zustande, in *Hufeland's* Journal d. prakt. Heilk. Febr. 1827, p. 3. (Is the left side in brutes also more frequently affected than the right?)

(2) This is the case, at least according to my own experience, as I have found likewise the lungs, kidneys, testicles, and ovaries more frequently diseased on the left than on the right side, though some writers maintain the reverse.

(3) For the rest moreover, all parts belonging to a particular system have a disposition to the same diseases, which was first noticed by *Bichat;* compare also *Hohnbaum* über das Fortschreiten des Krankheitsprocesses, insbesondere der Entzündung u. s. w. 8vo. Hildburghausen, 1826, p. 52—299.

SECOND SECTION.

Of Vices relating to Number.

§ 11.

These naturally arise out of the DIMINUTION OR INCREASE of the normal number of animal parts; still, however, both of these abnormal conditions occur not unfrequently in the same individual, so that whilst in one part a deficient formation is observed, in another it is seen in excess.[1]

(1) For example, monsters with prominent deficiency exhibit perhaps a supernumerary finger or toe; and double monsters perhaps a deficiency in some one part. To the latter observations those cases in some measure belong, in which, of twins or triplings one only is found very deficiently formed; [of which an instance is given by *J. Warner*, in Phil. Trans. Vol. LX. 1770, in which a woman was delivered of a live child of full growth, together with a very small fœtus, which had no visible connexion with the placenta, but was squeezed flat, and seemed shrivelled, but not at all putrid. In the Mus. Coll. Surg. Lond. is a similar very beautiful instance in a twin abortion of six months; one of the embryons had attained its perfect size, whilst the other does not exceed half an inch in its total length, and, like Warner's case, is not in the least connected to the placenta, but near its edge attached to the chorion; it was at first mistaken for a hydatid. T.]

§ 12.

The COMPLETE DEFICIENCY, *defectus*, of a particular part, or the diminished number of such organs as are multiplicate, is very frequent. We distinguish the ORIGINAL from the ACQUIRED DEFECT; the former is observed chiefly in respect to every part of an animal body, without the conformation of the remaining parts being necessarily disturbed by it;[1] although, indeed, we observe oftentimes, in this respect, certain sympathetic proportions between certain organs.[2] Frequently the external form of the body is tolerably regular, whilst one or other of the internal parts are wanting. Again, some organs are more frequently wanting than others,[3] and sometimes so many at once, that, instead of a fœtus, merely a head, or an extremity, or nothing more than an unseemly lump of flesh, is produced; still, however, of the general systems, the external skin and cellular tissue, and, perhaps, also the nervous and vascular systems, are never wholly deficient. As in the first stage of the embryon, almost all organs are as yet wanting, so does this want of parts principally belong to retarded formations.

A peculiar kind of numerical diminution of some parts arises out of the original consolidation of two similar, usually separate organs, into one.[4]

(1) Compare below, *Monstra per defectum*.—The comparison of the deficiency of parts, with the possibility of preserving life, is of considerable interest to physiology.

(2) Thus, for instance, generally, though not always, the peripheral parts of a system are deficient at the same time with its central, v. *Mayer*, p. 228, and *Meckel*, p. 310, in Archiv f. Anat. und Physiol. 1826, No. II.; the heart commonly with the head; the renal glands frequently with deficient brain; the external organs of generation with deficient lower extremities, &c.

(3) For example, the brain, urinary and genital organs, much more frequently than the heart, the liver, or intestinal canal; the deficiency of the upper half of the body is not quite rare; that of the lower half, with complete formation of the upper, is unheard of, &c.

(4) Compare § 30.

§ 13.

The ACQUIRED DEFICIENCY of certain limbs or parts arises either from mechanical causes or from disorganization. To the first cause belong the accidental or intentional mutilations,[1] viz. amputations, extirpations, &c., which are sometimes very similar to the original defective formations;—to the latter we refer the rare total wasting of single organs by increased absorption, and the more frequent destruction by ulceration, mortification, &c.

(1) The subsequently reproduced parts of inferior animals, occasionally present a diminished number of their component parts; for instance, the feet of salamanders have fewer toes. v. *Spallanzani's* Physical and Mathematical Treatises, p. 62.

§ 14.

The IRREGULAR MULTIPLICATION of the parts of a body is also frequently observed;[1] in the higher classes of animals it is always congenital, whereas in the lower classes it also occurs subsequently, and can sometimes be even artificially produced.[2] The degree of multiplicity ascends from the reduplication of single parts only in manifold degrees up to that of almost the whole body,[3] but extends only in very rare cases beyond the doubling of the normal number.[4] The frequency of reduplication also varies very much in the several parts of the body.[5] The superabundant parts are in general connected with the similar normal parts, yet there are also exceptions to this law.[6]

Finally, it is proper to distinguish from the real multiplicity of organs, that which is only a seeming increase owing to the congenital division of an organ into two halves or into several smaller pieces, and which belongs rather to Vices of Form.[7]

(1) *Meckel* De duplicitate monstrosa commentarius, fol. Halæ, 1815, with eight engravings.—*Bréschet* in Archives générales de Médecine, Paris, Dec. 1823.—*J. C. L. Barkow* Commentatio Anatomico Physiolog. de Monstris duplicibus, 4to. Leipzig, 1828, with engravings.

(2) The reproduced fore feet of salamanders acquire occasionally five toes instead of four, v. *Platteretti*, in Opusc. scelti di Milano, Vol. XXVII. p. 26, note. In lizards we can, by a particular injury of the tail, easily occasion the production of a second; the reproduced claws of a crab have occasionally a supernumerary finger, (claw) &c.

(3) Compare below, *Monstra per excessum.*

(4) There are a few examples of monsters with three heads, three tails, three thumbs on the claw of a crab, &c.

(5) Accessory intestines and organs of sense, for example, are much more rare than a multiplicity of the extremities and their parts.

(6) For instance, the bronchi of accessory lungs opened in one instance into the stomach, v. *Otto* Selt. Beob. Part I. p. 15.

(7) Compare § 23.

THIRD SECTION.

Of Vices relating to Size.

§ 15.

Vices of this kind deviate from the normal bulk in two ways, that is, by diminution and by enlargement; they may be, further, either original or produced at a later period, but in many cases it is difficult to distinguish between the two;[1] finally, they may exist only at the time when they are observed.

(1) [*Changeux* Sur les Nains et sur les Geants, Journ. de Physique, Vol. XIII. p. 167. T.]

§ 16.

The ORIGINAL IRREGULAR DIMINUTIVENESS, *magnitudo imminuta*, seu *parvitas genuina*, may affect the whole body or only particular parts; consequently it is either GENERAL or LOCAL. The first we call DWARFISHNESS, *microsomia*, and the beings so circumstanced DWARFS, *pumiliones, nani pygmæi.*[1] Such individuals are either born very small or grow but little at a subsequent period. Sometimes dwarfishness is hereditary, or affects many brothers and sisters,[1*] especially twins and triplings; and this not unfrequently occurs in animals, especially the domestic.[2]

(1) Compare *G. Fr. Jäger* Vergleichung einiger durch Fettigkeit oder kolossale Bildung ausgezeichneter Kinder und EINIGER ZWERGE, 8vo. Stuttgart, 1821. —*Plouquet* Repertor. Art. Pygmæus.—*Virey* Histoire naturelle du genre humain, 2d edit. Vol. II. p. 265.—*Reuss* Repertor. Commentat. Vol. I. p. 104, and Vol. X. p. 44 and 299.—*Wünsch* Unterhaltungen über den Menschen, 2d edit. Vol. I. p. 319.—The oberamtsactuarius Joseph Hoedle, of Endingen, is 30 inches high; Elizabeth Ralph, of Devonshire, was, in her twenty-first year, only 2 feet 10 inches high, and 20 pounds in weight, &c. There are said to have been adults of 18 and even 16 inches height. [The smallest authentic case is that of Madlle. Crachami, whose skeleton is in the Museum of the Royal College of Surgeons, No. 7 of the Osteological Series, and measures exactly 20 inches in height; but Mr. Clift informs me that when exhibited, she was said to be only 18 inches, which must of course have been incorrect. She died in her tenth year, in the summer of 1824, at London. v. Catalogue of the Mus. Roy. Coll. Surg. in Lond. There is also in the College Museum, a painting of the Corsican fairy, which measures 2 feet 7½ inches high. She was exhibited in London about the same time as Byrne. v. Section 20, note 2. Among Mr. Hunter's papers there is a memorandum, unfortunately without name or date, of "A little dwarf woman, at Norwich, 34 inches in height," which is believed, by Mr. Clift, to refer to this painting. And it goes on to state, that she cohabited "with a great fellow she called her husband," and became pregnant. She went her full time, but as might have been expected, from the smallness of the pelvis, the labour was difficult, and it was necessary to open the child's head; after which, the delivery was effected. The child measured 22 inches; "so that," says the writer of the memorandum, "if it could have stood upright in utero, it would have risen above

its mother's head." The woman died four hours after delivery. Boruwlaski, the celebrated Polish dwarf, measured 39 inches in height when thirty years old. He was, till very lately, if not at present, living at Durham. T.]

(1*) [It is remarkable, that of the six children of which Boruwlaski's father's family consisted, they were born alternately short and tall;—the eldest son was 3 feet 6 inches, and lived to sixty years of age; the second, 5 feet 10, and died at twenty-six years; Boruwlaski himself was the third; the fourth and sixth were of the common height; but a daughter, who was the fifth child, measured only 2 feet 2 inches, and died at twenty-two. T.]

(2) Especially the case in dogs; I have likewise seen it in horses and goats.

§ 17.

The irregular diminutiveness is more frequently but PARTIAL, so that particular organs only do not acquire their proper size, and are therefore disproportioned to the rest of the body: thus the head,[1] the trunk, or, finally, the extremities[1*] may be too small in proportion to the other parts. Such malproportions occur frequently in giants and dwarfs. In monsters, the enlargement of a particular part is frequently effected as it were at the expense of other parts; the accessory parts in double monsters, as well as the reproduced parts in animals, as the tails of lizards and serpents are usually too small, and so remain. General weakness, lameness, and continued pressure,[2] diminished flow of the juices, &c. not unfrequently retard the growth. Often, together with the natural size of the other parts, the whole systems are backward in their development, and either remain small or are developed at an unusually late period; this is most commonly observed in the sexual parts,[3] more rarely in the respiratory organs, and least frequently in the vascular and bony systems.[4]

In hollow organs, and especially in certain canals, an IRREGULAR NARROWING, and even COMPLETE IMPERVIOUSNESS, is often the consequence of deficient development; the latter is called, especially if it affect the mouths of such canals, CONGENITAL CLOSURE, *atresia congenita*, which, as it is always observed in the early stage of fœtal existence, in new-born infants has been found as an irregular appearance in all the openings of the body.

(1) A remarkable instance given by *Hell* D. de concretione digitorum, 8vo. Landsh. 1820, with figures.

(1*) [A very good instance of disproportionate limbs, was a man, who, some years ago, might have been seen on Blackfriars' Bridge, sitting in a little chair, making pens, and from his habits, known as Drunken Andrew (the King of the Beggars). He was altogether of small make, save his head, which was that of an adult; but his lower extremities did not exceed those of a child of four years old, and were not capable of supporting his weight; he was, therefore, obliged to wheel his little chair about on crutches. T.]

(2) For example, the small feet of the Chinese.

(3) With which also the pubic hair, and in man the beard and larynx—in women the breasts usually sympathize. In the male sex I have seen smallness

Senate weighed 78 pounds v. Stones Every day book Vol 1 - p 1027

of the genitals most frequently occasioned by onanism; a remarkable example of impeded development from caries, and of quick maturity after amputation of the diseased member, is given by *Martini* in *Rust's* Magaz. d. ges. Heilk. Vol. XIX. Part III. p. 590. Complete development of the whole body and of the genital organs from pressure on the medulla oblongata is described by *Lenhoss* in the Medic. Jahrb. d. K. K. Oesterreich. Staates. N. F. Vol. III. Part I. p. 96.

(4) Most frequently, however, with respect to the teeth.

§ 18.

The ACQUIRED DIMINUTIVENESS differs in this respect from the original, that parts which are already developed and of their natural size, as it were, retrograde and diminish; this can but seldom occur generally, and can then, in the higher animals, whose bodies by means of the skeleton possess a certain permanent proportion, only affect the soft parts,[1] which, deprived more or less of their interstitial, fatty, gelatinous and serous parts, exhibit a morbid DRYNESS, LEANNESS, and WASTING, *macies*, *macor*, *marasmus*, *tabes* or *atrophia universalis*.[2] The diminution is more frequently only local or in one system, and then is called WASTING, *atrophia* or *tabes partialis*, also *aridura*;[3] it is either merely the consequence of diminished nutrition,[3*] or it is also connected at the same time with degeneration of the tissue, particularly often with hardening and ossification. Almost every part of the body, even the hardest parts, as the bones and cartilages, are subject to wasting, which may arise from manifold causes; but especially from external or internal pressure, from tearing, from the contraction or closing up of the nutrient blood vessels, from palsy of the nerves, from long continued rest,[3**] and from inflammation, and in rare cases attains such a degree, that the parts affected by it entirely disappear.[4] If wasting occur in the hollow organs, their sides become unnaturally thin, and sometimes so weak, that they can no longer resist the force which expands them.

(1) Sometimes, however, the whole body becomes somewhat shorter and smaller by wasting of the intervertebral ligaments, of the articular cartilages, and even of the bones. Injuries, also, may, without the cause being recognized at the time, diminish the size of the body; thus I know a man, who, by fracture of both thigh bones, has become about four inches shorter, without being otherwise deformed. The shrivelling of animals, as the mollusca, belongs rather to emaciation than to the present subject.

(2) Perhaps more correctly *Oligotrophia*. A striking example of this is the so called 'living skeleton,' Claude Ambroise Seurat, who, on account of his extreme leanness, has been exhibited for money. v. *Froriep's* Notizen, Vol. XI. No. 20, p. 313, with a figure. The emaciation is greatest in diseases of the digestive organs; on the other hand, it is occasionally not consequent on ulceration and other diseases of the urinary organs, of the breast, cancer of the rectum, &c. Compare *Pemberton's* Practical Treatise on various diseases of the abdomen, p. 186. Compare Art. *Atrophia* in *Plouquet's* Repertorium.

(3) *Nürnberger* D. de atrophia partiali, s. de ariduris. 4to. Wittenb. 1792.

(3*) [A remarkable instance of wasting from this cause occurred several years since, when a part of Dover cliff fell down, by which a pig, known to have weighed, just before the accident, eight score, or 160 pounds, was buried. The animal remained entombed during one hundred and sixty days, when, as the workmen were clearing away the rubbish, they thought they heard a weak moan, and directing their labours in the direction of the noise, soon met with the pig, the life of which had been preserved by a piece of the cliff having lodged over its stye; during this time it had had no food, beyond perhaps the litter and biting the chalk, on which its teeth marks were visible, and the water which had run through the cliff. When taken out, it weighed only two score, or 40 pounds. T.]

(3**) [There is a fine specimen of this state of the thigh bone in the Mus. Coll. Surg. Lond. No. 448, in which the body of the bone does not exceed $\frac{5}{8}$ths of an inch in diameter, but the cause is not known. There is also a similar instance in the Mus. Lond. Univers. of the upper arm bone. T.]

(4) For instance, the chrystalline lens after depression; the testicles in syphilitic persons.

§ 19.

A peculiar form of morbid diminution is the CONTRACTION OF CANALS and CAVITIES, *strictura, coarctatio,* produced by the contractility existing in almost all animal tissues, and often much increased by morbid irritants;[1]—by deficiency of expansile power;[2]—by thickening of the walls of the canal;[3]—by external pressure, &c. The highest degree of narrowing is the MORBID CLOSURE, *atresia morbosa,* which, however, is much more rare than the congenital.

(1) For example, by stones in the biliary and urinary bladder.

(2) Thus, blood-vessels and excretory ducts which convey no fluids, contract themselves in consequence,—the intestinal canal below the fœcal fistula,—articular cavities after dislocation,—the sockets after extraction of the teeth,—all bony canals when the vessels or nerves passing through them disappear, even the cavities of the orbits and chest, when their contents collapse.

(3) Frequently in the alimentary canal and urethra.

§ 20.

To the excessive smallness is opposed the IRREGULAR MAGNITUDE, *magnitudo aucta,* which may be either ORIGINAL or ACQUIRED subsequently. The former is not unfrequently GENERAL, affecting the whole body, for children may be born unusually large and strong,[1] or during youth, they may have an unnaturally active growth,[1*] and thus attain a size which remarkably exceeds the ordinary bulk. This is called GIANTISM, *macrosomia, magnitudo gigantea,* and individuals so affected are called GIANTS, *homines prægrandes, gigantes.*[2] This giantism occurs also, though not so commonly in brutes.[2*] In many instances irregular magnitude is united with unusual fatness,[3] not unfrequently, also, a premature puberty, and

development of the whole body;[4] the latter, however, also occurs without irregular enlargement.[5]

The PARTIAL and original irregular magnitude is also not unfrequently consequent on too great nutrition of certain parts of the body, and occurs most frequently in such monsters as have defective formation in other parts.

(1) Compare below the fœtus.

(1*) [A very remarkable instance of precocious development is given in Phil. Trans. Vol. XLIII. 1745, by Rev. Mr. Almon and Mr. Dawkes, of a boy, aged three years and one month, who was 3 feet 11 inches high. But a more remarkable instance is Philip Howorth, of whom an account is given by Mr. White, Surgeon to the Westminster Hospital, in Med. Chir. Trans. Vol. I. p. 276, who arrived at premature puberty between two and three years old, and at three years measured 3 feet 2 inches in height. Mr. White has kindly informed me that he arrived at 5 feet, his full height, at the end of six years; he is now alive, and twenty-two years old, is married, and has one child, a girl, and follows the occupation of a ladies' shoemaker. His appearance does not differ from that which persons of the same period of life possess; that is, no marks of premature old age, either by grey hairs, or the countenance. T.]

(2) Compare *Plouquet* Repertorium Art. Gigas.—*Reuss* Repertor. Commentat. Vol. I. p. 101, and Vol. X. p. 42.—*Wünsch* Unterhaltungen über den Menschen, 2d edit.—*Virey* Histoire naturelle du genre humain, 2d edit. Vol. II. p. 257. The greatest size in man appears to be 8 feet 1—2. [Charles Byrne, commonly called the Irish Giant, was twenty-two years old at the time of his death, in 1783; he measured, when dead, 8 feet 4 inches; neither of his family were of extraordinary size. His skeleton is in the Hunterian Collection, Mus. Royal Coll. Surg. Lond. and measures 7 feet 8½ inches in height. T.]

(2*) [Mr. Clift mentioned to me, that about twenty-five years ago he had seen a horse 20 hands high, which was exhibited in Piccadilly. T.]

(3) *G. F. Jäger* Vergleichung einiger durch Fettigkeit oder kolossale Bildung ausgezeichneter Kinder und einiger Zwerge. 8vo. Stuttgart, 1821.—*Meckel* Handb. der pathol. Anat. Vol. II. Part II. p. 121.—*Diez*, in the Russ. Sammlung f. Naturwissenchaft und Heilkunst, Vol. II. Part II. p. 243, describes two very fat children of the same parents.

(4) *Meckel* Vol. II. Part I. p. 2.—*Jäger*.—*Reuss* Vol. X. p. 298.—Later cases are described, by *Harless* Rhein. Jahrb. der Medic. und Chir. Vol. I. Part II.—*Ulrich* in the same, Vol. II. Part II. p. 194.—v. *Lenhossek* in d. medic. Jahrb. d. K. K. Oester. Staates. Vol. VI. Part III.—*Bréschet* in Journ. général de Médec. No. 291, Feb. 1821.—*J. F. South* in London med. chir. Transact. Vol. XII. Part I. p. 76.—*Descuret* in Nouv. Journ. de Médecine, Vol. VII. p. 100.—v. *Duchamp* Maladies de la croissance. Paris, 1823.—*D'Outrepont* Gemeinsame deutsh. Zeitschr. f. Geburtskunde. Vol. I. Part I. p. 151.—*Diefenbach*, in *Meckel's* Archiv f. die Anat. u. Physiol. 1827, No. 3, p. 367.—*Hufeland's* Journal, Sept. 1827, p. 124.

(5) For example, in the silk worms, BOMBYX MORI, which occasionally, after the fourth casting of the skin, and previous to spinning, change into moths, which retain considerable resemblance to the grub, and thus at once present an instance of premature development and retarded formation. v. *Müller* Decouverte d'un papillon à tête de chenille (Phalæna Vinula) in the Mémoir présent, Vol. VI. p. 508.—*Majoli* in the Giornale di fisica, etc. del regno Italico, 1813, Vol. V. p. 399. Compare *Mecklel's* D. Archiv. f. d. physiol. Vol. II. p. 542.

§ 21.

The ACQUIRED MAGNITUDE appears as a general condition of the animal body, only in the form of excessive and morbid

collections of lymph, jelly, and fat in the tissues of the body, *polysarcia, obesitas, pinguetudo, corpulentia nimia*,[1] by which, often the circumference and weight of the body, both in man and animals, is extraordinarily increased.[2] The abnormal enlargement of SINGLE PARTS is also very frequent, it occurs without or with, which last is much the more frequent, MORBID TEXTURE; the FORMER is the consequence either of an excessive local nutrition, *hypertrophia*, arising from increased local vital activity, when, for example, one viscus undertakes the office of another,[3] or of itself is much overexerted,[4] or there is too great deposition of fat in particular spots.[5] The ENLARGEMENT OF PARTICULAR PARTS UNITED WITH CHANGE OF TEXTURE, is produced very frequently, and in manifold ways, by morbid turgescence and expansion of the vessels of an organ, INFLAMMATORY TUMOURS, *physconia, infarctus, obstructio*,[6] by actual change of the internal tissue, by the formation of tumours, &c. From this kind of irregular enlargement, is in its nature, the MORBID EXTENSION OF HOLLOW ORGANS, *extentio*, very different, as in the latter the walls are usually unable, from cotemporaneous RELAXATION, *relaxatio*, and THINNING, *extenuatio*, nay, sometimes even from thickening,[7] to withstand the extending force of the contained fluids, and are thus not unfrequently disposed to burst. Oftentimes, also, such partial extensions of canals are the consequence of strictures of the same organ at other spots; lastly, there is one particular form of enlargement which appertains here, viz. the STRETCHING or EXPANSION, *expansio*, of solid parts,[8] by mechanical tearing, and by tumours.

(1) *Quelmaz* D. de pinguedine ejusque sede tam secundum quam præter naturam constituta. 4to Lips. 1748.—*Jansen* Pinguedinis animalis consideratio physiol. et patholog. 8vo. L. B. 1784.—*Reussing* D. de pinguedine sana et morbosa. Ienæ, 1791.—*Seifert* D. phys. pathol. de pinguedine. Gryph. 1794.—*Clark* D. de pinguedine. Edinb. 1797.—*Lorry* Adhandl. über das Fett in dem menschl. Körper, über dessen Eigenschaften und Fehler, etc. translated from the French by *Lindemann*. 8vo. Berlin, 1797.—*Dandouville* D. sur l'obesité. 4to. Paris, 1811.—*Dupuytren* in Journ. de Médec. Vol. XII. p. 262.—*Marcuse* D. de obesitate nimia. 8vo. Berol. 1819.—*Maciari*, in Giorn. della Soc. med. chir. di Parma, Vol. IX. p. 168.—Many instances in *Reuss*, Vol. XIV. p. 181—183.—Amputations of the larger limbs, and castration, are frequently causes of unnatural fatness.—Adiposis, Dict. des Sc. médicales, article Obésité, Corpulence, Graisse.

(2) The most striking example is the London butcher, Falstaff, who died in his thirty-second year, and weighed 800 pounds. [I believe the most authentic cases, however, are those of Edward Bright, of Malden, who weighed 584 pounds, and died at twenty-nine years of age; and Daniel Lambert, of Leicester, who weighed 739 pounds, and died at forty years.

(3) The spleen for the liver, and the reverse—one kidney for the other, &c.

(4) The thickening of particular muscles which have been much exercised, the muscular coats of hollow organs, from obstructed evacuation of their contents, &c.

(5) For example, on the neck and face of anencephalous monsters, from great

flow of blood into the carotis facialis, with diminution or closure of the carotis cerebralis—in the belly—in the spermatic cord (the so called liparocele,)—in the cellular tissue under the skin, (compare below lipomata,)—near cancerous tumours, &c.

(6) *Rezia* De viscerum, quam dicunt obstructione cum molis incremento in ej. Specimen observationum anatom. et pathologicar. Ticini, 1784, and Venedig, 1802.—*Rubini* in Memorie di Matem. e. Fisica di Verona, Vol. VII. in *Weigel's* Italiän. Biblioth. Vol. IV. p. 33.—*Cassan* in Mémoir. de la Soc. médic. d'émulation, An. V. p. 68.—Infarctus and obstructio are also called, particularly by the older writers, vices of the intestines.

(7) For example, the heart in active aneurysms, and the womb, in case of tumours in its cavity.

(8) For instance, artificial elongation of the lobes of the ear, of the hips, of the labra, by the introduction of foreign bodies;—expansion of membranes, tendons, muscles, by tumours.

FOURTH SECTION.

Of Vices relating to Form.

§ 22.

The VICES OF FORM, MALFORMATIONS, *deformitates, formæ alienæ*,[1] are likewise either original or acquired—general or local—simple or compound, that is, connected with changes of another kind. General deformity is very rare; on the contrary, partial deformity is very frequent and in endless variety, according to the individual parts in which it occurs.[2]

(1) *Maisonnabe* Recueil d'observationes sur les difformités dont le corps humain est susceptible à toutes époques de la vie et surtout ce qui se rapporte en général à la Mécanique et aux instrumens employés en chirurgie, avec fig. Paris, 1825. As difference of figure in a minor degree is the character of all organic bodies, we can here regard the higher degrees only.

(2) It will be therefore treated of specially under these subjects.

§ 23.

The principal species of malformation are: first, the simple, in which a part is too long, too broad, too round, too angular, &c.; then that which arises from vice of number, followed very naturally by vices of conformation, which originate in the division of an elsewhere single organ into two or more parts, often improperly accounted true duplications; sometimes the organ is not entirely divided, but merely marked by a deep cleft, or if it be a hollow viscus, divided more or less perfectly, sometimes by a stricture, sometimes by an internal partition. This division of an organ into several parts is often a kind of

retarded formation, and as such, is frequently exhibited in the bony system, by the nonconsolidation of the original bony germs, in the lobular form of the kidneys, as in the embryon, and in the womb by its division into two horns; so also on the muscles, tendons, nerves, blood-vessels, and some of the viscera, we frequently observe their abnormal division into more or less distinct parts.

§ 24.

There are still other kinds of vices of conformation, in which the SIZE of individual organs is unnatural, and consequently there is a want of symmetry and proportion; further, those depending on ALTERED POSITION and CONNEXION OF PARTS for instance, ruptures, prolapses, and those which are conjoined with CHANGE OF TEXTURE, as contractions, tumours, excrescences, dropsies, &c.,—finally, such as are consecutive to MECHANICAL INJURIES, viz. amputations, extirpations, divisions, scars, ligatures, &c. The most frequently occurring deformities are produced by VICES OF THE BONY SYSTEM which draw the soft structure after them; to these belong CURVATURES, *incurvationes, curvituræ,* of the neck, the back, and the long bones, —DISTORTIONS, *distortiones,*[1] of the spine, of the feet, for instance, club-hands, and club-feet,—DISLOCATIONS, *luxationes* —unnatural joints—the shortening or oblique direction of united fractures, &c.

(1) On Congenital distortion, v. *Bourquenod,* in Annal. de la Soc. de Médec. de Montpellier, Vol. I. Part I. p. 182.—*Devilher* Diss. sur l'entorse. Paris, 1812.—*Matthias* præs. *Reil* D. diversis morborum localium formis ad contracturæ genus revocandis. 8vo. Berol. 1811.—*Joerg* Ueber die Verkrümmungen des menschl. Körpers, etc. 4to. Leipzig, 1816, with six copper-plates.

FIFTH SECTION.

Of Vices relating to Position.

§ 25.

UNNATURAL POSITION, *situs alienus, perversus, dislocatio,* is never GENERAL, as all parts of the body cannot be affected by it, but only PARTIAL. It may be either original or acquired; but in the more advanced periods of life we cannot distinguish the two kinds with certainty. To the first

species belong especially the LATERAL TRANSPOSITION or MISPLACEMENT of the organs contained in the thoracic and abdominal cavities,[1] so that the parts ordinarily lying on the left, are placed on the right, and those on the right, on the left side. This irregularity is sometimes found merely in one or several organs, now and then only in the viscera of the chest, or in those of the belly;[2] but most commonly in the parts contained in both those cavities,[3] and usually without disturbance of the health. Not unfrequently certain parts are situated either too high or too low, as original or acquired conditions; viz. the heart in the belly, the kidneys in the pelvis, &c., or the abdominal viscera in phrenic hernia in the chest, the testicles, at an advanced age, in the belly, &c. Should the viscera become too weighty, or the parts by which they are supported too lax, they sink down, according to the laws of gravitation, oftentimes very low. In other cases, one portion of a hollow organ is received into another, INTUSSUSCEPTION, *intussusceptio.* They are often thrust out of their proper place, either by curvatures of the body, by collection of fluids, or by tumours, and even squeeze themselves out of their proper cavity, if morbidly swollen, as is the case with the eye-ball, tongue, and the articular ends of bones.

(1) *Situs Mutatus*, *Transpositio*, *Inversio Viscerum*, also *Anastrophe.*

(2) See examples in the description of the thorax and abdomen.

(3) *Metzger* Pr. de translocatione viscerum. Regiom. 1797. Many old examples in *Haller*, Opera min. Vol. III. p. 16. note 9.—*Morand* Hist. de l'Acad. roy. des Sc. 1688, p. 44.—*Bertrand* s. *Cattieri* o. m. XVII.—*Hoffmann* Cardianastr. Lips. 1771.—*Mohrenheim* Wiener Beiträge. Vol. II. p. 305.—*Sampson*, in Phil. Transact. Vol. IX. No. 107, p. 746.—*Gauteron* Mém. de Montpellier. I. Hist. p. 110. and VIII.—*Stoll* Rat. medendi. I. p. 290.—*Holt* in Phil. Transac. Vol. XXII. No. 225, p. 992. — *Sandifort* Observ. anat. pathol. lib. I. cap. 2, p. 39; lib. IV. cap. 6, p. 54—60.—*Baillie* in Lond. med. Journ. 1789. Vol. X. Part II. No. 6. — *Lentin* Beitr. zur ausüb. Arzneiw. Vol. II. p. 76.—*Roemer* Sylloge Opusc. Ital. Fasc. I.—*Hufeland* Journal. Vol. XXII. p. 110.—v. *Siebold* Sammlung chir. Beobacht. Vol. II. p. 331.—*Aubertin* in Journ. de Médec. Vol. LXV. p. 408.—*Bichat* Sur la Vie et la Mort. — *Jacob* in Journ. de Médec. cont. Sept. 1811. p. 214. — *Larrey* Mém. de Chir. milit. Vol. I. Paris, 1812. — *Béclard* in Bullet. de la Soc. médic. d'emulation, Dec. 1816. p. 328, and Bullet. de la Soc. philomat. 1817.—*Herhold* v. *Thomson's* Annals of Philos. July, 1819, p. 55. (to which belong two unpublished plates, for which I am indebted to the author.)—*Nacquart* and *Piorry* in Journ. génér. de Med. Vol. LXXII. p. 48.—*Omer* in Observat. des Sc. médic. März, 1822.—*Ullersperger* pathol. anat. Beschreib. zweier Missgeburten. p. 44. Würzburg, 1822.—*Wetzler* s. Berliner Nachrichten v. Staats-u. gelehrten Sachen. No. 2. 1817.—*Remsay* in Medic. Repository, New York, new ser. Vol. IV. Part II. 1817.—*Heger* præs. *Emmert* D. de inversa corp. hum. structura. Tübing. 1816.—*Desrouelles* in Bull. de la Soc. médic. d'émulation, Févr. 1821, p. 41.—*Bryan* in Transact. of the Associat. of Irish Physic. Vol. IV. No. 14.—*Douglas Fox* in Lond. med. and surg. Journ. June, 1824.—*Doubled* in Archiv. général. de Médec. Dec. 1824.—*Scoutetten* v. *v. Froriep's* Notizen, Vol. VI. No. 8, p. 128.—*Nägele* in d. Heidelb. klin. Annalen. Vol. I. Part IV. p. 507.—*Sue* in Auserl. Abhandl. der Akademie d. Winsensch. zu Paris übers. von *Beer.* Leipz. 1754. Vol. II.

p. 315.—*J. F. Meckel* D. de cordis conditionibus abnormibus. 4to. Halæ, 1802. Tab. I. Fig. 4.—*G. Gamage* in New-England Journ. of Medec. and Surgery, Vol. IV. p. 224—246.—*My* Selt. Beob. Part II. p. 173.—*Rose* in London med. and physic. Journ. Oct. 1826.—*Baron* in Medic. chir. Trans. 1827. Vol. III. p. 153. —*Serre* in Archives générales de Médecine, 1827. Vol. XVI. and in Nouvelle Bibliothèque médicale, December, 1827. — *F. G. Wette* D. de situ viscerum inverso. (in one instance.) 8vo. Berol. 1827.—*Moncreiff* in Edinb. med. and surg. Journal, No. 95, April, 1827, p. 440. — *Barbieux* in Annales de la méd. physiol. Paris, 1828. I have seen since a case of an adult man in the Anatomico-pathological Museum at Vienna, No. 1800; and also found a similar instance in a brewer's servant, æt. 45. v. No. 8870, of the Breslau Museum. I know no instance of it in animals.

§ 26.

Two particular, and as frequent as important, forms of dislocation are, RUPTURES, *herniæ*, and PROLAPSES, *prolapsus*. In the FORMER, one or more of the viscera pass either partially or completely from their proper cavity into an unnatural sac or bag;[1] in the LATTER, a viscus wholly or partially protrudes, without its investing membrane, through an original aperture, and is then either simply protruded, or at the same time INVERTED, *inversio*. Finally, the altered position of parts in ruptures and prolapses is to be distinguished from original or accidental misplacement, *propendentia, evisceratio,* of the viscera, consequent on separation of the parieties of the cavities in which they are otherwise contained, either congenital, or dependent on ruptures and wounds.

(1) The so-called internal herniæ are strangulations; the diaphragmatic hernia, however, with the exception of those which have a sac, belong to the original or accidental misplacement, *evisceratio*.

§ 27.

When certain parts have, at one period, an actual progressive motion, or are supposed to continue it, their unnatural situation has been named DEVIATION, ABERRATION, *deviatio, aberratio*. To this, for instance, belong the descent of the testicles under the crural arch, or into the perinæum, and the anomalous course of the vessels.

§ 28.

Finally, the position of parts may be so far irregular, that although not out of their usual place, they may have an ABNORMAL DIRECTION, *directio perversa, obliquitas,* &c., so that their axis is changed. These vices are observed in several viscera, viz. in the eye, heart, stomach, kidneys, and womb, indeed, even in the bones; thus, for example, the teeth are

placed sometimes obliquely, sometimes transversely, and sometimes even turned round.[1]

(1) [In the Mus. Coll. Surg. Lond. there is one specimen of an incisive tooth, the crown of which protrudes into the nose. T.]

SIXTH SECTION.

Of Vices relating to Connexion.

§ 29.

VICES OF CONNEXION, *vitia nexus*, may consist in the diminution or entire suspension, and in the increase of the natural connexion and contiguity of a part with those in its neighbourhood. To the FORMER KIND belong the NON-ATTACHMENT of a part, in consequence of defective formation, for instance, of the intestines, from absence of the mesentery; the REMOVAL of two viscera from each other dependent on laxity of the cellular and membranous parts by which they are connected; the SEPARATION, *diastasis*, of two immovably connected bones from each other, and the removal of the articular ends of two bones from each other, DISLOCATION, *luxatio*, as it is called.

§ 30.

The irregular INCREASED CONNEXION of two organs may be either original or acquired; the first is especially noticed in the CONGENITAL COALESCENCE[1] of two or more parts into one common part, which assumes more or less the trace of duplication. As the abnormally consolidated parts have at their commencement, either sprung from a common centre, or are so close that they touch each other, so it may be explained how partly the confused activity of development in the organ itself, partly deficiency of room, and in fine partly the want of power to separate in the parts otherwise interposed, may produce such consolidated formations. As instances of these, may be given the consolidation of two neighbouring vertebræ, ribs, muscles, the fingers and toes, the two kidneys and the renal glands; CYCLOPY, in which both eyes, the front of the brain, and sometimes also the two nostrils, are seen running into one; next, the imperfect development of the lower part of the face, in which the ears, the muscles, the salivary glands and ducts of

both sides are found consolidated; further, the CLOACAL FORMATION,[2] as it is called, which is produced by the union of the lower part of the urinary, generative, and alimentary organs into one common cavity, similar to, although sufficiently distinct from the cloaca of animals; and lastly, the most perfect degree of coalescence in the human subject, the SYREN FORMATION, in which even the whole of the lower extremities are united into one common limb.

(1) *Meckel* über die Verschmelzungsbildungen in his Archiv. f. Anat. und Physiol, 1826, No. II. p. 238.
(2) Handbuch der pathol. Anatomie. Vol. I. p. 698.

§ 31.

Much more frequent than the original abnormally increased connexion of different organs, is that which is acquired, the AGGLUTINATION, or COALESCENCE, *concretio*,[1] arising from the effusion of fibrine consequent on inflammation. Sometimes this occurs merely locally between neighbouring parts, at other times more generally between many parts; it can affect all parts of the body, and can be produced artificially by the approximation of sore surfaces. The coalescence is either close and intimate, so that the parts are every where in contact, or it is looser, so that newly formed fibres and bands connect the organs. The coalescence can occur also in a single organ, if it be hollow, and agglutinate one side of the canal with the other, as in the blood-vessels; sometimes also the excretory ducts of secreting organs, the alimentary canal, &c. are seen closed, *atresia morbosa*. If two otherwise movable bones become united, it is called a STIFF JOINT, *anchylosis*.[2]

(1) *Bergen* D. de coalitu viscerum. Francof. 1736. — *Hebenstreit* D. de partium coalescentia morbosa. Lips. 1738.—*Haller's* Diss. pr. VI. No. 209.—*Orell* D. de viscerum nexibus insolitis. Helmst. 1743.—*Reil* D. de concretionibus organorum morbosis. Halæ, 1795. — *Cruveilhier* Essai sur l'anatomie pathologique en général. 8vo. Paris, 1816. Vol. I. p. 142—181. — *Plouquet* Repertor. Art. Viscer. Coalitus. Compare below Inflammatio Exsudativa.
(2) Compare Fifteenth Section, On the Bones.

feathers, the bleaching of dark eyes, &c.; the cause of this bleaching of the above-named parts is found in the diminution or total removal of the colouring matter. The frequent loss of colour in the mucous membrane of the mouth, and of the alimentary canal after poisoning with the concentrated acids and with tartar emetic,[2] is also worthy of notice.

(1.) Very frequently also in animals, to wit, in diseased fishes. [The Anemia of *Andral.* v. his Précis d'Anatomie Pathologique, Vol. I. p. 74. The paleness of the body after severe or repeated hæmorrhage arises from the same cause, viz. diminution of the blood generally, and of its cruor in particular. Butchers are therefore accustomed to bleed their calves, for the purpose of rendering the veal whiter. T.]

(1*) [*W. P. Dewees,* A singular case of alteration of the colour of the hair during parturition, in which all in front of the coronal suture changed completely white in the course of an hour, in consequence of alarm. On the following day it was much less white, and in four or five days its usual colour had returned. v. Philadelphia Medical Museum, edited by Dr. Cox. Vol. III. p. 219, 1807. T.]

(2) I have seen it more than once after poisoning by sulphuric acid, and the very white colour of the mucous membrane is by no means merely dependent on thickening and relaxing of the epithelium.

§ 35.

The abnormally increased colour of an organ, or the DEEPENING OF ITS COLOUR, depends in some cases, and especially in muscles originally pale, upon hypertrophy; but most commonly on the gorging of a part with blood, which has been augmented in it by congestion and stagnation, *stasis;* this is very often observed in the lungs, the liver, the spleen, and the mucous membrane of the alimentary canal.* Sometimes it happens that the congested blood is itself unnaturally deep coloured, and thus doubly deepens the colour of the part in which it is collected; this is especially the case after suffocation, apoplexy, poisoning with narcotic substances, and hydrocyanic acid, adynamic fevers, and especially in the blue disease.[1] A red or bluish colour is often observed in certain parts of the body, produced by congestion of blood in the most delicate vessels, for instance, DEATH SPOTS, *lividitas, nigror, sugillationes spuriæ,* the form, extent, and colour of which are very variable, according to circumstances; further, we notice similar red and dusky spots on the internal parts, arising from the same causes, as on the intestines, and more especially on their mucous coat; and the dusky colouring of those parts into which, if they be lowest, the blood sinks according to the laws of gravitation;[2] such spots are produced, even sometime after death, on the putrefaction and thawing of frozen corpses.

(*) [Some few years back, I saw a very remarkable instance of this gorging with blood, in the mucous membrane of the stomach of a man who had fallen dead in the street, and was brought into St. Thomas's Hospital. The whole

internal surface of the stomach was of a bright red colour, and looked like velvet there were no other morbid appearances, nor was any history of his previous life obtained. T.]

(1) A good engraving of a person affected with the blue disease is to be found in the Chirurg. Kupfertafeln. Weimer, 1820. Pl. 53—55.

(2) In the common position on the back, also in the soft structures on the side of the spine, in the hinder part of the lungs and liver, as well as those parts of the small intestines which lie in the lesser pelvis.

§ 36.

From this kind of dusky spots we must distinguish other similar colourings which originate in the percolation of the darker juices after death; thus we sometimes observe in persons who have died of inflammation of the lungs accompanied with their adhesion to the pleura, large livid or violet-coloured spots on the chest; on the stomach there are seen dusky red spots, where it is in contact with the blood-gorged liver and spleen. The large venous trunks filled with blood often colour the neighbouring parts,[1] and the gall-bladder very frequently tinges a part of the adjacent stomach and duodenum with its bile. Sometimes, also, the naturally pale surfaces immediately in contact with the blood become equally red, for instance, the inner surface of the heart, the great arterial trunks, the rectum in piles; a peculiar change in the blood seems to be the cause of this colouring.

(1) We easily distinguish these spots by the neighbouring causes, and because the external surface of the organ merely is coloured, or the colouring, if it have penetrated deeper, still diminishes gradually.

§ 37.

A particular kind of deeper colouring is also produced by EXTRAVASATION, *ecchymosis, ecchymoma, effusio, suffusio, sugillatio,* either under the skin, or more deeply, but which differs from the above described similar spots, as it is produced by the actual effusion of blood from the vessels into the cellular membrane of the part. This usually accompanies a BRUISE, *contusio;* but it is not unfrequently consequent on severe strains of a part, on suckling in delicate skinned women, on great muscular exertions, on coughing, vomiting, and on many diseases, especially scurvy, petechial fevers, the morbus hæmorrhagicus of Werlhof, &c. These extravasations are at first blackish or blue, and distinctly circumscribed, but by degrees become more extended, as it were, fade, and by little and little assume a violet, greenish and yellow colour.[1]

(1) Importance of distinguishing these spots from inflammatory redness. §§ 35—37.

§ 38.

Further, the irregular colouring of animal bodies is often caused by the reception of various extraneous colouring matters into the body. This is observed almost generally in the lower animals, especially in the parasitic, when living on different kinds of food;[1] also locally, as the consequence of various medicines and poisons;[1*] thus the bones of men, beasts and birds, are more or less reddened by food of a red colour.[2] The taking of rhubarb often tinges light parts yellow; hydrocyanic acid renders many organs bluish or greenish; nitrate of silver,[3] quack medicines, of which the composition is unknown,[4] and other medicines,[5] often render the skin blackish.

(1) For instance, the aphis, the louse, fresh oysters, &c.

(1*) [*I. Ingenhousz*, Some further considerations on the influence of the vegetable kingdom on the animal creation, in Phil. Trans. Vol. LXXXII. p. 426.]

(2) This also occurs in wild animals; for example, in the water rat, of which I have seen one instance. [*H. Baker*, On the effects of the Opuntia or Prickly Pear, and of the Indigo Plant, in colouring the juices of living animals, in Phil. Trans. Vol. L. p. 296.—*Gibson*, On the effect of Madder Root on the Bones of Animals. Manchest. Mem. new ser. Vol. I. p. 146. T.]

(3) *Swediauer* in *Fourcroy* La Médecine éclairée par les Sc. physiques. Vol. I. p. 342.—*Albers* in Medic. chir. Transact. Vol. VII. Part I. p. 284; and *Roget*, *ib.* p. 290.—*Butini* De usu interno præparationum argenti. Genf. 1815.—*Baillie* s. N. Samml. auserl. Abhandl. z. Gebr. pr. Aerzte. Vol. IX. Part III. p. 379.—*Wedemeyer* in *Rust's* and *Casper's* Krit. Repertorium. Vol. XIX. Part III. p. 454.

(4) A secret of my grandfather's on my mother's side, *Dr. Weigel*, of Stralsund, produced, in some instances, to my own knowledge, a general dark colour of the skin.

(5) Transiently after the use of sulphur and quicksilver, by which a kind of ÆTHIOPS is formed. v. *Rigby*, in London Medical Repository, Jan. 1817.

§ 39.

Finally, we oftentimes observe some peculiar colouring matter or pigment[1] spontaneously produced in animal bodies, and colouring certain parts more or less completely; such is the case in jaundice, *icterus*, and in *melanosis*. In the former disease there is formed in the body a yellow animal extractive or colouring matter, which has great similarity to the pigment of the bile, and tinges almost all the solid and fluid parts of the body more or less yellow and dusky, however, so that many of the systems assume a yellow colour more frequently than others.[2] Diseases of the liver, asthenic fevers, as the plague, the American yellow fever,[2*] typhus fever, &c., are commonly attended with jaundice; the same also occurs in animals, but much less frequently. In *melanosis*,[3] on the contrary, a deep brown or more frequently a blackish tinted pigment is morbidly produced, which occurs sometimes generally, sometimes to a limited extent; in the former, it is either mingled with the particular excretions, as the urine, the perspiration, the

mucus from the lungs, in certain cases also, perhaps (in the matter evacuated) in *Melæna*,[3] or the BLACK DISEASE of Hippocrates, and colours them blackish; or it may be deposited as a fluid or semi-coagulated mucus on the expanded surface of serous membranes, particularly the peritoneum and pleura.[4] In the confined state the black pigment is found accumulated either in the otherwise healthy substance of an organ, especially of the skin, of the lungs, of the bronchial glands, &c., or it may accompany the various vices of texture, as mortification, particularly of the dry kind, false membranes, soft swellings, scirrhus, cancer, medullary sarcoma, and most commonly, at least in animals, tubercular swellings.[5]

(1) *G. Jaeger* Ueber das Vorkommen von Kohle in menschl. Gallensteinen, nebst einigen Bemerkungen über Verkohlung organischer Körper überhaupt, in Meckel's Archiv f. d. Physiol. Vol. VI. p. 485.—*Heusinger* Untersuchungen über die anomale Kohlen und Pigmentbildung in dem menschlichen Körper, mit besonderer Beziehung auf Melanosen, u. s. w. Eisenach, 1823.—*A. Retzius* in Svenska Lakare-Pällskapets Handlingar. Vol. X.

(2) The skin, the cellular tissue and muscles, for instance, more commonly than bone and cartilage; most rarely the nervous system.—The KIRRHONOSE of Lobstein (v. his papers in the Zeitschrift f. Physiol. of *Tiedemann* and *G. R.* and *L. C. Treviranus*, Vol. II. Part I. p. 79, and in Repertoire gén. d'Anat. et de Physiol. pathol. Paris, 1826, Vol. I. Part I. p. 141). A yellow colouring of the serous membranes and nervous medulla in the fœtus I have also occasionally observed, but have considered it not actually different from the jaundice.

(2*) [*Pariset* Observations sur la fièvre jaune. 4to. Paris, 1820. T.]

(3) *Dupuytren* appears to have first drawn attention to this disease. v. Journ. de Médec. de *Corvisart*, Vol. X. p. 89—96.—*Bayle*, in Recherches sur la Phthisie pulmonaire, Paris, 1810, Obs. XX. and XXI.; and *Laennec*, in Journ. de Médec. de *Corvisart*, Vol. IX. p. 368, first employed the name, *Melanose*, and distinguished thereby, especially, a kind of sarcom; on *Melanosis* in general, compare *Laennec* de l'auscultation médiate, etc. 8vo. Paris, 1819, Vol. I. p. 299.—*Bréschet* in *Magendie's* Journ. de Physiol. expérim. Vol. I. No. 4. p. 354.—*Merat* in the Journ. des Sc. médicales. Vol. XXXII. Art. Mélanose, p. 183.—*Heusinger*.—*Noack* Comment. de Melanosi cum in hominibus tum in equis obveniente, etc. 4to. c. trib. tab. æn. Lips. et Paris, 1826.—*Savenco* Tentamen pathologico-anatomicum de Melanosi. Petropoli, 1825.—*Schier* D. de morbo quodam maculoso, quem Melanosin recentiores appellant. 8vo. Berol. 1826.—[*Graves* M. D. Clin. Observ. in Dublin Hosp. Reports. Vol. IV. p. 69. 8vo. Dublin.—*G. Breschet* Considerations sur une alteration organique appelée Degenerescence Noire, Melanose, Cancer, Melané, etc. 8vo. Paris, 1821.—*B. Travers*, Observations on the local diseases called Malignant, in Med. Chir. Trans. Vol. XV. p. 195. T.]

(3*) *J. Cheyne*, M. D. Case of Melæna in Dublin Hosp. Rep. Vol. I. p. 259, 1817; a remarkable instance, in which the production of the secretion peculiar to this disease, alternated with increased activity in the serous membranes.—*A. Portal* Observations sur la nature et sur le traitement du Melæna in Mem. de la Societ. d'Emulat. Vol. II. p. 167.

(4) Melanosis membranacea in *Merat* and *Noack*.

(5) See the Tenth Section, On Vices of Texture.

EIGHTH SECTION.

Of Vices relating to Consistence.

§ 40.

The irregularities of animal parts with reference to their SOLIDITY, CONSISTENCE, *consistentia*,[1] *i. e.* the normal degree of the intimate connexion of their elementary parts, originate in the vices of solidity and power of cohesion; therefore, whatever disturbs these, diminishes or increases the power of an organ to resist mechanical influences. The difference of consistence, according to age and individuality, the latter of which the antients distinguished by the terms FIBRA LAXA, MOLLIS and DENSA, RIGIDA, &c., do not belong here; but such changes of consistence as are produced by morbid activity of nourishment, disproportion of the fluid to the solid parts, and especially by vices of texture. Only in few instances are the vices of texture not perceptible in irregular consistence, although they are in fact always present.

(1) *Meckel* Handb. d. pathol. Anat. Vol. II. Part. II. p. 6.

§ 41.

The DIMINUTION of CONSISTENCE, or the MORBID SOFTNESS, LAXITY, PULPINESS, *mollities, laxitas, marcor*, &c., is most frequently the consequence of irritation and inflammation, under which both the thickness and power of cohesion, as well as the texture of an organ, are changed. Diminished consistence, therefore, is not merely the concomitant of suppuration and mortification, but also of the less distinguishable changes of nourishment in quality and quantity occurring with and after irritation and inflammation. Whatever produces relaxation of the tissue, be it an increased influx of the juices, for instance, as in dropsy of the organ, or a morbidly increased internal absorption, produces softness or pulpiness, from which the hardest and toughest parts, as the bony, cartilaginous and horny tissues, do not escape, which is most striking on account of their opposite state. Sometimes the morbid softening, it appears, is connected with peculiar proportions of mixture, and so great, that the parts affected are converted into an actual inorganic pultaceous mass, for instance, the brain and spinal marrow, and especially the stomach and neighbouring parts, in the so called softening of the stomach; but in other cases, the consistence of a part is considerably diminished without any ob-

servable vice of mixture or texture. This is most frequently found in the brain and in the muscles.

§ 42.

The opposite state or the unnaturally INCREASED CONSISTENCE of a part, the morbid HARDNESS, RIGIDITY, *induratio, rigiditas,* &c., arises from the increased compactness and power of cohesion in the part, which may originate either in the mere unnatural contraction of the animal tissues and the diminution of the part; in the diminution of the juices and the augmentation of the solid and especially earthy parts; in the effusion of more or less coagulated fluids into the parenchymatous structure of the part, for instance, in the induration, *induratio,* consequent on inflammation; and finally, in those peculiar changes which can neither be reckoned as vices of mixture or structure, although, perhaps, they really are so; to the latter kind belong a peculiar kind of solidity and dryness of the muscles and of the brain.

NINTH SECTION.

Of Vices relating to Continuity.

§ 43.

Vices of consistence very naturally lead to those of CONTINUITY, which consist in the breaking up, in the actual SEPARATION OF THE INTIMATE CONNEXION OF AN ORGAN, *solutio continuitatis.* If the power of resistance in an animal tissue be diminished, then even a relatively moderate mechanical power will act in proportion too strongly, and produce a separation of the intimate composition of a part; but more frequently this is also effected by the actual operation of external causes, even where the normal degree of consistence exists. The first more properly belongs here, the last rather to surgery.

§ 44.

The breach of continuity of a part may be either ORIGINAL or ACQUIRED. To the former belong the not unfrequent

CLEFTS OF THE FRONT AND BACK OF THE BODY, in the mesial perpendicular line;[1] these are perhaps in part retarded formations, but more commonly the consequence of early morbid distension of the walls of the cavities, from the too early development and size of the parts therein contained, from dropsies, &c. They occur also in different degrees, so that the organs found in the cavities of the body are either entirely exposed, or rather are covered by their investing membranes, which are then much thinned, and occasionally expanded like bags, and even found torn.[2] In this manner are observed clefts of the spine, of the skull, of the lips and palate, of the breast, belly, and front of the pelvis, either alone or several of them at the same time.

(1) *Meckel's* Haudbuch der pathol. Anatom. Vol. I. p. 93.—The particular kinds will be treated of in the separate organs.

(2) It is incorrect, when these thin membranes are described as mere *dura mater, peritoneum,* &c. as the common integuments always exist at the same time, although indeed they are very thin.

§ 45.

The ACQUIRED vices of continuity are more frequent; they are the consequence of mechanical causes, and are commonly called LESIONS, *læsiones.* To these belong the recent divisions of continuity by mechanical penetrating violence, *i. e.* WOUNDS, *vulnera,* to wit, both the simple, as cuts, chops and stabs, and the complicated, as contused, gunshot wounds, burns, &c.; further, partial or complete lacerations and ruptures, *dilaceratio, ruptura,* of parts violently extended or shaken;[1] and, lastly, FRACTURES OF BONES, *fracturæ ossium.* Similar lesions now and then occur without any external violence, especially in the vices of consistence, from mechanical causes existing in the body itself, for instance, fractures of bones and ruptures of tendons by the action of the muscles, the bursting of cavities, from their too great distension by the fluids which they contain, &c.

(1) For instance, of the internal viscera without wounds of the sides of their inclosing cavities—remarkable transmission of concussion from distant parts.—*Janson* Essai sur les ruptures des tissus et des organes du corps humain. 4to. Paris, 1813.

§ 46.

Lastly, we must here also mention that SPONTANEOUS and MORBID *separation* of parts from the general organism which occurs, not from violence, but consequent on their irregular nourishment or total decay, viz. the shedding of the cuticle, the hair, the nails, horny excrescences, the teeth, the separation of

mortified parts, indeed of whole limbs destroyed by mortification, the drying up and falling off of supernumerary parts in monsters,[1] and the throwing off of polyps, and growths of other kind, which have separated themselves completely from the parts out of which they had grown.

(1) I possess a full grown goose, yet alive, of which the greater portion of the hind part of the body is double; two supernumerary feet dried up to the heel, and fell off.

TENTH SECTION.

Of Vices relating to Texture.

§ 47.

As in healthy animal bodies their component parts are in a continual state of change and growth, so must we naturally expect this should occur still more in many diseases, and easily amount to a perceptible change of the tissues. Hence, then, VICES OF TEXTURE or DEGENERATIONS OF THE TISSUE, *vitia texturæ, desorganisationes*,[1] are very common, and in regard to their cause, in most intimate connexion with the already mentioned vices of size, form, colour, and consistence.

(1) *Dumas* Sur les transformations des organes in *Sedillot* Journ. génér. Vol. XXIII—XXV.—*Laennec* in *Corvisart*, etc. Journ. de Médec. Vol. XI. p. 360, and in Dict. des Sc. méd. Vol. II. Art. Anatomie pathologique.—*Bugayski* D. de part. corp. hum. solidar. simil. aberrationibus. 4to. Berlin, 1813.—*Cruveilhier* Essai sur l'anatomie pathologique en général, et sur les transformations et productions organiques en particulier, 2 vols. 8vo. Paris, 1826.—*Meckel* Handb. der pathol. Anatomie. Vol. II. Part II. — *Heusinger* System der Histologie. Part I. p. 87—103, 4to. Eisenach, 1822, and in the first Berichte von der königl. anthropotomischen Anstalt zu Würzburg, p. 1—41. 4to. 1826.—*Boulland* in Révue médic. Française et étrangère, etc. Sept. Paris, 1825.

§ 48.

All degenerations of the animal tissue are either CONVERSION of the normal into an abnormal substance, as MORBID METAMORPHOSES, *transformationes, degenerationes*, or entirely NEW FORMATIONS, in their stead; or specially substances not previously existing, SPURIOUS FORMATIONS, *pseudoplasmata, pseudorganisationes;* or, finally, a MIXED STATE of the changed and new formations.[1] We often find many kinds of

morbid changes and spurious formations existing together, and the diseased part a diversified compound of the extraneous tissue, which is so circumstanced, that the newly presented morbid substance perforates the original tissue, and is deposited between its fibres and layers, or is more or less distinctly defined; the latter is especially the case with the spurious formations, which, lying in their proper bed, are attached as it were by roots to the diseased organ, but sometimes are connected extensively with its surface, or still distinctly circumscribed in it, and even enclosed in their proper surrounding membrane or bag, and merely displace by their position the original substance, or produce its absorption by pressure.

(1) The diagnosis of this state, as well as of its various kinds, is often very difficult and even impossible; much which appears to be a mere change of the tissue is a new formation; thus, many cartilaginations and ossifications by which the loose extraneous body is enclosed in fine plates of normal tissue; further, the apparent conversion of a muscle into fat, whilst the muscular fibres exist pale and wasted, but at the same time the fat deposited between them is also lost; the spurious formations are also often at first very similar to each other, but these, at a subsequent period, vary from each other according to the difference of the organ to which they are attached. One kind also frequently runs into another.

§ 49.

All the parts of an animal body are subject to vices of texture, however, not in a similar degree; some indeed are more subject to morbid metamorphosis; others, for example the skin, mucous membrane, and glandular organs, rather incline to spurious formations. Hence also many arise from age, inasmuch as disorganizations generally appear to occur less frequently in the earlier than in the later periods of life; but almost every age has its peculiar or more common vice of texture.[1]

(1) For example, in childhood, tubercles; in later life, cancer and ossification.

§ 50.

According to the nature of a part, a certain though very obscure change both in quantity and quality of the activity of nutrition, must be considered as the next cause of the vicious condition of its tissue; but this again, especially, is derived from the defective development of the organism, from the termination of activity in a part, or from certain diseases. From the first cause arises the RETARDED FORMATION OF THE TISSUE, in which a part remains in the same state as during fœtal existence;[1] from the second, the so called RECEDING FORMATION of the no more used tissue, which, in such cases, is not merely diminished, but frequently at the same

time again resolves itself into the original pre-existing cellular tissue;[2] finally, from the third cause, viz. from various diseases, but especially from morbid irritation and inflammation, whence arise by far the greater number of vices of texture.

(1) Thus we find the bones cartilaginous, the tendons soft, the muscles jelly-like; some of the viscera, as thin membranous bags, filled with mucous-like fluid, &c. Restored parts sometimes exhibit a very imperfect texture; thus, for instance, I find in lizards, of which the tail had been broken off two years before, and had perfectly recovered its normal length and thickness, that the caudal vertebræ were still cartilaginous, and the muscles less fibrous and tough than usual.

(2) For example, muscles, blood-vessels, glands, and their excretory ducts, nerves, tendons, &c.

§ 51.

MORBID IRRITATION, *irritatio morbosa*, may be either GENERAL, as in fevers, or more commonly only LOCAL; it has also various degrees, in the higher of which, for instance catarrh, it approaches to inflammation. It has in many cases, when it attacks the lymphatics and veins, an increased resorption; more commonly, when it acts upon the arteries, an increased flow of blood passes to the irritated part, which therefore, after death, appears turgid, reddened, and as it were injected, and easily changes the quantity and quality of the secreted substances. Thus does morbid irritation lay, not merely the foundation for new and extraneous chemical operations, for coagulations, for partitions, but also produces the various diseased collections which are so often met with in dead subjects. To this belong the presence of various kinds of GASES, which doubtless arise not unfrequently from putrefaction, between the membranes of the brain, in the cavities of the brain, in the bags of the lungs, in the pericardium, in the belly, in the urinary bladder, in the womb, in the heart and blood-vessels, in the parenchyma of the intestines and in the cellular membrane;[1] further, the collection of WATER in almost every part, especially in the cellular tissue and in the serous membranes which line the cavities, whereby the different kinds of the common dropsies are produced: then the increase of MUCOUS-LIKE, GELATINOUS, or rather ALBUMINOUS MASSES, which are observed particularly in the mucous membranes spread over the cavities or canals of the body; and finally, the pouring out of blood, either pure or mingled with water, which escapes not from ruptured vessels, but actually exudes from the extreme branches of arteries, and indeed has been found in all the cavities of the body.[2]

(1) On all these parts have I observed collections of air, and partially several times. *J. Halliday*, D. de Pneumatosi. Edinb. 1806.—*Briere* in Nouv. Biblioth. Févr. et Mars, 1826.

(2) It appears to me to be more frequent in the intestinal canal, in the pericardium, and the ventricles of the brain, where I have found it, as also in the thorax and abdominal cavities, more than once; also in the horse, deer, and dog.

§ 52.

The most frequent cause of vice of texture is INFLAMMATION, *inflammatio, phlegmasia*;[1] here, however, only belong its essential symptoms, redness and swelling. The INFLAMMATORY BLUSH, *rubor inflammatorius*, depends on an unusual quantity of blood,[1*] essentially changed in its composition, contained in the inflamed part, partly indeed in the larger and smaller sanguiferous vessels, partly also in those extreme branches of the arteries which commonly convey no red blood (*vasa decolora*), and lastly, in part in the cellular tissue surrounding the arteries, in which it frequently appears exuding under the form of numerous small red spots. Under high degrees of inflammation, new small vessels are probably produced from the effused blood, which subsequently innosculate with the original vessels. During life, the blood-vessels of inflamed parts, usually at the commencement, exhibit a quicker motion, as well as a slight narrowing of their calibre, dependent on the degree of excitement operating on them; but the stream of blood gradually becomes slower, and at last entirely ceases, in most of the vessels, which then also expand, and are stopped up with the globules of cruor which they contain; some of these are dissolved in the fluid part of the blood, and so enter the *vasa decolora*. In the latter stages of inflammation, and as it runs on into other morbid states, the inflammatory blush is changed in various ways, especially by the solution and mingling of the globules of the blood; it is also visibly diminished in many organs after death.[2] The INFLAMMATORY SWELLING, *tumor inflammatorius*, which is regularly accompanied with distinct tension, *turgor*, depends for the most part both on the extension of many small blood-vessels, and on the simultaneous, often very great effusion of blood, fluid fibrous matter, and lymph into the tissue of the inflamed organs. After death, the inflammatory swelling subsides on account of the cessation of the living tension, and perhaps also on account of the activity of absorption, which the lymphatic vessels and veins both possess for a longer time, and if then felt, it is found less tense.

(1) *Vacca* L. de inflammationis morbosæ, quæ in hum. corp. fit, natura, causis, effectibus et curatione. 8vo. Flor. 1765.—*Brambilla* Chir. prakt. Abhandl. von der Phlegmone und ihren Ausgängen, aus d. Ital. 2 Thle. 8vo. Wien, 1773—75.—*J. Hunter*, Treatise on the Blood, Inflammation, and Gun-shot Wounds. 4to. London, 1795.—*Burns*, Dissertation on Inflammation. 2 vols. 8vo. Glasgow, 1800.—*Broussais* Hist. des Phlegmasies, ou Inflammations chroniques. Paris, 1802, 2 vols. 8vo.; 4th edit. 3 vols. 1826.—*Perret* Aperçu sur les phé-

nomènes généraux de l'inflammation, considérés dans les différens systèmes. 8vo. Paris. An. XI. — *Jolly* Phlegmasies des organes parenchymateux. 4to. Paris, 1812.—*J. Thomson,* Lectures on Inflammation, &c. Edinburgh, 1813.—*Dzondi* De inflammatione Aphorismor. 8vo. lib. I. Halæ, 1814.—*Gruithuisen* Theorie der Entzündung, in der Salzb. medic. chir. Zeitg. Vol. II. p. 129. 1816. (v. also *ib.* Vol. II. p. 298, 1811.) — *Dohlhof* D. de phlegmone. 8vo. Halæ, 1819.—*Philip,* An experimental inquiry into the laws of the Vital Functions. 8vo. 2d edit. Lond. 1818. — *Nichol* in Lond. med. Repository, Vol. XVI. Aug. 1821.—*James,* Observations on some of the general principles and on the particular nature and treatment of the different species of Inflammation, &c. 8vo. Lond. 1821. — *C. E. Lucas,* M. D. On the Principles of Inflammation. 8vo. Lond. 1821. — *Scholefield* D. de theoria inflammationis. Edinb. 1822.—*Waring* D. de inflammatione. Edinb. 1823.—*Spörer* D. de inflammatione, morbo animalium et vegetabilium. 8vo. Dorpati Livonor. 1824.—*Koenig* D. s. experimenta quædam circa sanguinis inflammatorii et sani qualitatem diversam instituta. 4to. Bonnæ, 1824.—*Prus* De l'irritation et de la Phlegmasie, etc. 8vo. Paris, 1825.—*Koch* D. de observationibus nonnullis microscopicis sanguinis cursum et inflammationem spect. etc. 8vo. Berol. 1825.—*Burdach* D. observat. nonnullæ microsc. inflammationem spectantes. 8vo. Regiom. 1825. — *Black,* A short Inquiry into the capillary Circulation of the Blood, with a comparative View of the more intimate nature of Inflammation, &c. 8vo. London, 1825.—*Gendrin* Histoire anatomique des inflammations. 8vo. Paris. 1826.—*Kaltenbrunner* Experimenta circa statum sanguinis et vasorum in inflammatione. 4to. c. tab. novem. Monachii, 1826.—*Hohnbaum* Ueber das Fortschreiten des Krankheitsprocesses, insbesondere der Entzündung, etc. 8vo. Hildburghausen, 1826. v.—As to Literature, *Scavini,* Précis historique de la doctrine de l'inflammation depuis Hippocrate jusq'à nos jours. 8vo. Turin, 1811.—*Meier* Versuch einer krit. Geschichte der Entzündung. 1ter Thl. 8vo. Berlin, 1812. v. *Plouquet* Repertor. Art. Inflammatio. — *Reuss* Repertorium Commentat. T. XIV. p. 21.—*Göllner* D. de inflammatione. 8vo. Halæ, 1821. — *A. Goldoni* Sulla inflammazione, trattato diviso in tre parti. Part I. Modena, 1825.—*Gisbert van Beers* D. de texturæ organorum per inflammationem mutatione. Bonnæ, 1826.—*Bargen* D. de inflammatione ejusque theoriis. 8vo. Berol. 1827.—*Wedemeyer* Untersuchungen über den Kreislauf des Blutes. Hanover, 1828.—*J. Syme* in Edinb. med. and surg. Journ. No. 97, Octob. 1828. — *J. Scott,* Surgical Observations on the treatment of chronic Inflammation. London, 1828.—*J. Brown,* Medical Essays on Fever, Inflammation, &c. London, 1828.—*Küpper* D. de inflammatione et præsertim de puris generatione. 8vo. Berol. 1828.—*M. Naumann* Zur Lehre v. der Entzündung. Bonn, 1828. — *Gendrin* Histoire Anatomique des Inflammations. 2 vols. 8vo. Paris, 1822.—*Dzondi* Pathologiæ inflammationis systematum corp. hum. succincta adumbratio. Halæ, 1829.

(1*) [The Hyperémie Sthenique of Andral, which however is not merely confined to inflammation, although then more enduring; but in every state in which, from irritation, more blood is sent to a part than usual, as in blushing, &c. v. his Précis Anat. Path. Vol. I. p. 12. T.]

(2) It is very important to distinguish the inflammatory redness from the above described red colouring (Seventh Section); most difficult, and sometimes even impossible, is the certain distinction of the redness produced by milder degrees of inflammation from the injection produced by violent irritation, or from congestion. The examination with a lens, and observation of the consistence of the part, afford, in such cases, the best results. Compare *Boulland* in Révue médicale Franç. et étrangère. Mai, 1825.

§ 53.

Inflammation attacks all parts of animal bodies,[1] but in very different degrees of frequency, thus, the cellular tissue, the common integuments, the serous and mucous membranes, the intestines, and among these, especially such as have an

abundance of cellular tissue and vessels, as the lungs; then the muscles, great vessels, nerves, are most usually affected with the consequences of inflammation, whilst the tendons, ligaments, cartilages, and bones, are least so. In general external parts are more frequently affected by inflammation, than internal; further, it may be confined merely to a single spot, or many parts may be affected by it at one and the same time, even the whole limb; now it attacks merely the surface or investiture of a part, as the ERYSIPELATOUS INFLAMMATION, *inflammatio erysipelacea*, or at the same time it penetrates into the deeper parts, and into the parenchyma of the intestines as PHLEGMONOUS INFLAMMATION, *phlegmone*. It is uncommonly varied, in proportion as the parts affected have a different structure; thus the redness and swelling are much greater in the organs abundantly supplied with vascular and cellular tissue, than in the reverse; the duration and termination of inflammation is therefore also very different. Inflammation also varies exceedingly, according to the difference of age and constitution;[2] next according, to the variety of the morbid causes, in proportion as they are internal, dynamic, chemical, or lastly, mechanical;[3] finally, in reference, to the character of the disease itself, it may be either a COMMON or SIMPLE, or a SPECIFIC INFLAMMATION.[4] Here also we must make particular mention, on account of their importance, of the OCCULT or HIDDEN INFLAMMATIONS, so called, which are seated especially in the intestines of the three great cavities of the body, and during life often exhibit no distinct or determinate symptoms. They occur both in men and animals, accompanying especially the true or sporadic fevers, many exanthematous diseases, hydrophobia, and very frequently, in the puriform consumption, in the intestines of the belly.[5]

(1) The horny system is usually excepted, although many kinds of horny softenings and excrescences on the frog of the horse's foot, (*bleym*), and the swellings of the bulb and pith of the hair, must be analogous to inflammation in other organs.

(2) There certainly does occur an inflammation of a peculiar kind in debilitated bodies, but no ASTHENIC INFLAMMATION, as this disease is always an increased local vital activity;—neither do I know a CHRONIC INFLAMMATION continuing for months or years; for that which is so considered is either irritation or disposition to inflammation, or the inflammation subsiding in one spot successively affects the others in disorganized, and especially in indurated parts.

(3) As the inflammation produced by wounds, contusions, frost, burns, corrosion with aquafortis, differs from the common spontaneous inflammation.

(4) For example, rheumatic, arthritic, scrofulous, syphilitic, carcinomatous, anthracic, &c.

(5) I have often seen the most decided marks of inflammation and incipient suppuration in the bodies of such persons as have died of sporadic and contagious typhus, as well as in animals which have been affected with similar poisons; in two instances also in men who had been destroyed by the small-pox;

often also in sheep which had been attacked with pockenkrankeit, but much more frequently the signs of inflammation are entirely wanting, and when they are present, they are equally to be considered as merely the consequence and not the cause of such diseases. The common reddening of particular viscera in persons who have died of adynamic fevers, which *Broussais* and *Tommassini* have considered as a sign of inflammation, is not in the least so, but the consequence of mere irritation, congestion, obstruction, &c. The most important writings on this subject are, *Stoll* Ratio medendi, Vol. VII. p. 73.—*Wienholt* D. de inflammationibus occultis viscerum. Gött. 1772.—*Meyer* D. de inflammationibus latentibus generatim, etc. Frankf. 1785. — *Meckel* D. dubia quædam circa inflammationes occultas in febribus putridis. Halæ, 1788.—*Reyland* Abhandlung von verborgenen und langwierigen Entzündungen. 8vo. Wien, 1790.—*Hartmann* D. de inflammatione, præsertim occultarum natura in genere. Götting. 1796.—*Nietsch* Ueber verborgene Entzündungen und die daraus entspringenden bedeutenden körperl. Uebel. 8vo. Frankf. 1819.—*Collineau :* Peut on mettre en doute l'existence des fièvres essentielles? etc. 8vo. Paris, 1823. —*Gendrin* Recherches sur la nature et les causes prochaines des fièvres. 8vo. Paris, 1823. — *Dujes* Essai phys. pathol. sur la nature de la fièvre, de l'inflammation et des principales neuroses. 2 vols. 8vo. Paris, 1823. — *Laso* Coleccion de inspecciones anatomicas relativas a la fiebre amarilla. 4to. Cadiz, 1821.—Medic. Geschichte des gelben Fiebers, etc. aus dem Franz. von *Liman.* 8vo. Berlin, 1824.—*J. Wendt* Die alte Lehre von den verborgenen Entzündungen durch neuere Beobachtungen bestätigt. 8vo. Breslau, 1824.—*Caffin* Traité analytique des maladies dites fièvres essentielles. 8vo. Paris, 1824.—*Castel* Refutation de la Doctrine medicale de M. Broussais, etc. 8vo. Paris, 1824.—*Bailly* Traité anat. pathol. des fièvres intermittentes simples et pernicieuses, etc. Paris, 1825.—*Boisseau* Pyretologie physiologique, etc. Paris, 1824.—*Gilbert* Mémoire: Existe-t-il toujours des traces d'inflammations dans les viscères abdominaux après des fièvres putrides et malignes? etc. 8vo. Paris, 1825.—On this question, v. *Vacquie* in Journ. compl. du Dict. des Sc. medicales, Nov. 1825.—*Chauffard* Traité sur les fièvres prétendues essentielles, etc. 8vo. Paris, 1825.—*Bouilland* Traité clinque et expérimental des fièvres dites essentielles. 8vo. Paris, 1826.—Upon the internal false inflammations, v. *L. E. Polidoro* in *Omodei's* Annali univers. di Medicina, Vol. XXXVIII. Ap. 1826, (against *Broussais.)*

§ 54.

If the inflammation abate without the occurrence of its essential phenomena, the blood congested in the delicate vessels is dispersed; the vessels themselves resume their normal number, and revert to their former calibre, the tissues gorged with blood again become emptied of it, and in a word, the normal condition of the tissue is restored: this is called RESOLUTION, *resolutio.* Should it not terminate thus happily, the inflammation is followed by the critical EFFUSION OF VARIOUS FLUIDS, SUPPURATION, SOFTENING, HARDENING, MORTIFICATION, and VARIOUS SPURIOUS FORMATIONS, all of which must be here separately treated of.

§ 55.

As to the morbidly secreted FLUIDS,[1] they may be produced now from the EXPANDED SURFACE OF THE ORGAN, and IN THE CAVITY receiving them, or they may be poured out in the PARENCHYMA OF THE PART ITSELF ;—in the former, they give

the fluid fibrous matter of the blood is poured out as a thin layer between the wounded surfaces, at first glues them together, by ADHESION or *per primam intentionem*, and subsequently heals them, when the exuded layer becomes organized and contains new blood-vessels, which open into the vessels of the wounded surfaces; in a similar way also can soft and hard parts, which have been completely separated from the body, and even a part of a foreign organism, be made to adhere. In cases of restoration there may also be formed on the wound, from the effused fibrous matter, little, soft, reddish, and cornlike congelations, called GRANULATIONS or FLESHY FUNGUSES,[2] which run together with the adjoining membrane into a kind of skin, are converted into cellular tissue, possess many fine blood-vessels, and whilst recent, continue to produce fleshy substances uniting in layers, until the cavity is filled up and the divided parts are united, upon which, then, finally a new skin is produced; this at first is very vascular and red, but gradually becomes white, expanded, often also somewhat thicker, or descends and becomes at the same time tendinous, and is called a SCAR, *cicatrix*. The granulations may rise too luxuriantly above the surface of the neighbouring parts, and are then very spongy and easily bleed, whence arises their name PROUD FLESH, *caro luxurians, fungosa, hypersarcosis.*

(1) *Tagliacozzi* De curtorum chirurgia per insitionem. Venet. 1597.—*Fabre* Mém. de l'Acad. de Chir. Vol. IV. p. 74.—*Louis* p. 106.—*Bezoet* D. de modo, quo natura solutum reintegr. 4to. L. B. 1763, in *Sandifort's* Thesaur. Diss. Vol. III. p. 149.—*Eyting* De Consolidatione vulnerum cum deperditione substantiæ. Argent. 1770.—*Murray* Comm. de reintegratione part. corp. animal. 4to. Götting. 1781.—*Haeberle* Beantwortung de Preisfrage, welche geschnittene und gehauene Wunden sollen durch Vereinigung und welche durch Eiterung. geheilt werden? 8vo. Wien, 1781.—*Domeier* D. de viribus naturæ medicatricis in reparandis et coadunandis partibus corp. human. abscissis. Gött. 1784.—*Hahn* D. de regeneratione partium mollium in vulnere. 4to. Gött. 1787.—*J. Moore*, On the process of nature in the healing of Wounds. Lond. 1789.—*White*, On the Regeneration of Animal Substances, in Mem. of the Soc. of Manchester, Vol I.—*Hoorn* De iis, quæ in partibus membri, præsertim osseis, amputatione vulnerati, notanda sunt. L. B. 1803.—*Baronio* Degli Innesti animali. 8vo. Milano. 1804.—*Eggers* Von der Wiedererzeugung. 8vo. Leipz. 1821.—*E. A. Carus* D. de vi naturæ medicatrice in formandis cicatricibus. Part I. 8vo. Lips, 1822.—*Suringar* Comm. med. de modo, quo natura versatur in restituendo omni. quod in corp. hum. solutum est. 4to. L. B. 1823.—*Wiesmann* De coalitu partium a reliquo corpore prorsus disjunctarum Comm. etc. c. tab. æn. 4to. Lips. 1824.—*Paul* Comm. physiol. chir. de vulneribus sanandis, in certam. liter. præm. ornata. 4to. Götting. 1825. cum duob. tab. æn.—*Salfelder* D. de reunione partium corp. hum. elementarium. 8vo. Jenæ, 1826.—*Fr. Paul* Comm. phys. chir. de vulneribus sanandis, etc. 4to. Göett. 1825, c. duob. tab æn.—[*J. C. Carpue*, An account of two successful Operations for restoring a lost Nose from the integuments of the forehead, with historical and physiological observations on the nasal operation, including descriptions of the Indian and Italian methods. 4to. Lond. 1816. — *C. F. Graeft* De rhinoplastice seu arte curtum nasum ad vivum restituendi commentatio. Latine edidit *J. F. C. Hecker*. 4to. Berol. 1818. T.]

(2) *Gerardin* Essai sur les phlogoses sarcopée et ostéopée ou l'inflammation considerée dans sus deux seules terminaisons le sarcose et l'ostéose. 4to. Paris, 1823.

§ 57.

SUPPURATION, *suppuratio, pyosis, pyogenia,* is the secretion,[1] produced by inflammation, of a peculiar fluid, viz. MATTER, *pus,*[2] a yellowish, bland, pappy or ointment-like substance, which especially consists of many little globules and serum,[3] and, according to the difference of the organs by which it is secreted, and the characters of the preceding inflammation, presents manifold differences in reference to its consistence, colour and composition.[4] The pus is often mixed with blood, mucus, mortified and thrown off animal fibres, and contains in consumption even little worms;[5] should it be very watery, ill coloured, disagreeable, and pungent, it is then called *ichor, sanies.* Pus can be secreted either from irritated and inflamed surfaces, particularly from mucous membranes, without abrasion or erosion of their surface; or there may exist at the same time with suppuration, a more or less important loss of substance from absorption, viz. ULCERATION, *ulceratio.*[6] In the latter case, the pus-secreting and eroded spot is either open on the external or internal surface of the body, and then called an ULCER, *ulcus,*[7] or it is deeply concealed under the investing membranes of the body and of the particular organ itself, forming a cavity filled with matter, an ABSCESS, *abscessus, apostema,*[8] which may vary much in size and form, and by the subsequent effusion of fibrous matter, is lined with a smooth mucous-like membrane, still, however, secreting matter. Only in rare cases are such abscesses cured by the absorption of the matter which they contain; more usually they make their way outwards, although sometimes also inwards, break, and allow the matter to escape, till the cavities are filled up by granulation. Should the abscess be situated deeply, and the passages by which the matter proceeds to the surface be narrow, long, and lined with a membrane resembling mucous membrane and secreting lymph,[9] such passages are then called SINUSES or FISTULAS, *fistulæ;* and these may also connect two or more abscesses with each other. If the sides of the abscess be destroyed, and various lateral outlets or sinuosities be produced, then the matter is poured into the surrounding cellular tissue; still, however, we sometimes find abscesses without any outlet, particularly if the tissue of the part be very tough, and the inflammation not active. All parts of the body have not the same disposition to suppuration, nor run thereinto with equal quickness after inflammation;[10] vascular and cellular

parts, as the mucous membranes, the common integuments, the cellular tissue, the muscles, and the parenchyma of the viscera, suppurate much more easily than the non vascular parts, as cartilage, bones, and the fibrous organs.

(1) Old writers erroneously imagined that pus consisted of a resolution of the fibrous and fluid parts of the animal body.—*Morgan* Puopoiesis s. Tentamen med. de puris confectione. Edinb. 1763.

(2) Compare *Plouquet* Repertorium Art. Pus. *Salmuth* D. de diagnosi puris. Goett. 1783.—*Brugmanns* D. de Pyogenia, sive mediis, quibus natura utitur in creando pure. Grönig. 1785.—*Nicolai* Theoret. und prakt. Abhandlung über Entzündung und Eiterung. Jena, 1736.—*Quesnay* Traité de la suppuration. 12mo. Paris, 1770.—*Home*, On the properties of Pus. 8vo. London, 1789; and also in Phil. Transact. 1819. p. 1—11.—*Pearson*, on the same. Part II. p. 294—317. 1810.—*Hoffmann* D. sententia de suppurationis natura. 8vo. Erlang. 1818.—Microscopische Untersuchungen über die Bildung des Eiters von *Kaltenbrunner* in *Heusinger's* Zeitschrift f. organ. Physik. Vol. I. Part III. p. 314.—*Fr. Petgold* D. de diagnosi puris. Kil. 1327.—*A. Pramann* D. de puris indole et genesi. 8vo. Berol. 1828.—[*Andral*, Vol. I. p. 388. T.]

(3) On the distinction and difference between pus and mucus, compare *Darwin*, Experiments establishing a criterion between mucilaginous and purulent matter, Lichfield, 1780.—*Grasmeyer* Abhandlung von dem Eiter, und den Mitteln ihn von allen andern Feuchtigkeiten zu unterscheiden. 8vo. Gött. 1790.—*Waldmann* D. disquisitiones de discrimine inter pus et pituitam. Marburg, 1807.—*Rizzetti* in Mém. de Turin, Vol. II. and III.—*Rossi* and *Michelotti*, on the same, Vol. III. p. 109.—*Brande* in Phil. Transact. 1809, p. 373.—v. *Paula Gruithuisen* Naturhist. Untersuchung über den Unterschied zwischen Eiter und Schleim durch das Mikroskop. 4to. München, 1809, with engr.—*Pearson.*—*Klaproth's* Chem. Wörterbuch, Vol. II. p. 45, 46.—*Goebel* in *Schweigger* u. *Meinecke's* N. Journ. f. Chemie und Physik. Vol. IV. Part IV. p. 408.—*Koch* D. de observationibus nonnullis microscopicis sanguinis cursum et inflammationem spectantibus, atque de suppuratione, adjecta analysi puris chemica. 8vo. Berol. 1825. The best means of distinguishing them is, in my opinion, the microscope.

(4) *Daucher* D. Momenta circa variam puris indolem in variis corporis hum. partibus suppuratis. Würzburg, 1804.—*Callisen's* System der neueren Chirurgie. Copenhagen, 1822. p. 559. note.

(5) *Rogers* in London medic. Journ.

(6) *I. Hunter*, Inflammatio suppurativa.—*A. Cooper*, Lectures on the Principles and Practice of Surgery, by *Tyrrell*.—*De Morin* D. Considérations générales sur l'erosion. Paris. 1806.

(7) There is great difference in ulcers, according to their seat and specific character;—if an ulcer be not covered, the pus hardens and forms a SCAB, *crusta*.—*B. Bell*, A Treatise on the Theory and Management of Ulcers. 8vo. Edinb. 1778.—*Bertrandi* Theoret. und prakt. Abhandlung von den Geschwüren, aus d. Ital. 8vo. Erfurt, 1790.—*Weber* Allgem. Helkologie, oder nosolog. therapeut. Darstellung der Geschwüre. Berlin, 1792.—*Hebenstreit*, Zusätze zu *Bell's* Abhandlung von d. Geschwüren. Leipzig, 1793.—*Underwood*, Surgical Tracts on Ulcers, &c. 8vo. 1799.—*Rust* Helkologie, oder über die Natur, Erkenntniss und Heilung der Geschwüre. 2 vols. 8vo. Wien, 1811. [*Andral*, Vol. I. p. 189. T.]

(8) *Severinus* De recondita abscessuum natura. 4to. Francof. 1643, and 4to. Lugd. Batav. 1724.—*David* Ueber die Eitergeschwülste, u. s. w. in Prix de l'Acad. de Chir. Vol. IV. p. 119.—*Clare* Ueber die Eitergeschwülste, aus d. Engl. in d. Samml. f. Wundärzte. Part IV. p. 127—143. N. Samml. Part I. p. 64—88.—*Du Roi* Cogitata quædam de abscessibus. Jenæ, 1798.—*Dupuy* de Saint-Julie Mémoire sur les Abcès ou Tumeurs purulents en général.—There is great difference in abscesses; the peculiar kinds are Boil, Carbuncle, Lymph-abscess, Pest-boil, &c.

(9) *Villermé* in *Roux'* Journ. de Médec. July, 1815, p. 242—261. v. *Meckel's* Archiv. f. d. Physiol. Vol. II. p. 471. [*Andral*, Vol. I. p. 252. T.]

(10) In many cases the suppuration takes place very quickly; earliest, and even after a few hours, in the mucous membrane.

§ 58.

If the morbid effusion which is consequent on inflammation occur not on the surface of the affected organ but in its interior structure, VICES OF CONSISTENCE, WITH OTHER DISTINCT CHANGES OF TEXTURE, and softening as well as hardening, will be easily excited, from this cause as well as from the more active change of substance produced by inflammation.[1] The SOFTENING and LOOSENING, *emollitio*, *mollities*,[2] of inflamed tissues appears to arise thus: when a considerable quantity of serum is poured out into the parenchyma of a part and loosens it, the hard parts at the same time also are removed by absorption, or their cohesion is diminished. However, it appears that there must be sometimes also an unknown chemical process acting to explain the softening. We observe this softening and loosening occur with and after inflammation in all the systems and parts of animal bodies; it is especially frequent and distinct in the brain, spinal marrow, and spleen; then also in the muco-serous and synovial membranes;[3] but it is not unfrequently observed in the hardest parts, as the tendons, ligaments, aponeuroses, cartilages, the horny substances, and even in the bones. The degree and kind of softening and loosening is in other respects subjected to many varieties, dependent partly on the texture of the organ, partly on the character of the inflammation itself; especially the so called acute inflammations, which cause the softening of the tissue; these may in rare cases be so violent, that the diseased part is resolved into a kind of jelly or pap, in which we cannot observe the least trace of an earlier existing organization.

(1) Compare above, the Eighth Section, on Vices of Consistence, without distinct vice of texture. But it is a question, whether many of these are not produced by morbid irritation and inflammation. This, in my opinion, is by no means doubtful, as relates to watery cancer, *noma*, and the so-called putrescence of the womb. It is still more the case as regards softening of the stomach; but it is disputed, as in metastatic abscesses, traces of inflammation are often indistinct both in life and death; notwithstanding that these must necessarily be present, although in a very trifling degree. *Gisbert van Beers* D. de tenturæ organorum per inflammationem mutatione. Bonnæ, 1825.

(2) *Hesse* Ueber die Erweichung der Gewebe und Organe des menschl. Körpers. 8vo. Leipzig, 1827.—[*Andral* Précis d'Anat. Path. Vol. I. p. 214. T.]

(3) The relaxation of such membranes, as well as the unusual easy separation of the various membranes from each other; to wit, in the alimentary canal, is one of the most certain signs of existing inflammation.

§ 59.

In HARDENING, *induratio*,[1] the fluid poured into the tissue of the diseased part under inflammation is more or less coagulated, mingled with the normal elementary parts of the organ, and consolidated into a firm mass. The substances effused are fibrous matter, and sometimes also albumen; in proportion as both are coagulated in a greater or less degree, and retain the animal fluid enclosed in them, or have been deprived of it by previous absorption, is the degree of hardening very different, till at length the effused and coagulated substance becomes organized, that is, assumes the character of cellular tissue, forms meshes, plates, fibres, &c., acquires small blood-vessels, and has now become a permanent part of the tissue. The more often inflammatory irritation recurs in an already hardened part, the greater becomes the degree of induration, which, in itself, also naturally varies, both according to the difference of the usual consistence of the organ attacked, as well as to the difference of the character of the inflammation; thus, especially, if inflammation occur in torpid or debilitated parts, it assumes this termination. Thickening and hardening of a part is also not unfrequently produced by long continued pressure. Should they be membranes which have become thickened and hardened, they remain mostly thick, and become opake, although they had been previously transparent; has a part, in its healthy state, a loose and soft texture, it can be rendered by the hardening as firm and tough as the liver, a vice which, when occurring in the lungs, has been named *hepatisatio*.[2] If with hardening already set up in the cellular tissue, we find, accompanying inflammation, an increased flow of blood, and increased redness, this condition is called the RED HARDENING, *induratio rubra*:[3] but on the contrary, if the inflammation have entirely subsided, and the quantity of blood and redness in the diseased parts are diminished, owing to the compression and adhesion of the vessels, then such is called WHITE HARDENING, *induratio alba*.[4] The latter not unfrequently becomes so exceedingly hard, that the indurated parts assume a true sinewy appearance, nay, even actually run into bone.

(1) *Hoernigk* D. de induratione partium præmatura. Lips. 1750.—*Haller* Pr. de induratis corp. hum. partibus. Goett. 1753.—*Bayle* in *Corvisart*, etc. Journ. de Médec. s. Edinb. med. and surg. Journ. Vol. II. Part VIII. No. 2.—*Wenzel* Ueber die Induration und das Geschwür in indurirten Theilen. 8vo. Mainz. 1815.—v. *Walther* in *Graefe's*, and v. *Walther's* Journ. der Chir. Vol. V. Part II. p. 196. [*G. Andral*, Précis d'Anat. Path. Vol. I. p. 199. T.]

(2) *Morgagni* De sedib. et caus. morbor. Ep. XXI. 2, 17, 19, 27.

(3) This is, however, divisible, and easily resoluble by suppuration; we com-

monly observe it in the neighbourhood of ulcers and abscesses, but sometimes also the parenchyma of a whole intestine is affected by it.

(4) To these belong, for example, the callous edges of many ulcers, the so-called cold swelling, the hardening and swelling of the almonds of the uvula from repeated attacks of inflammation, and the hardening in many organs; which, by the old practitioners, were improperly termed *scirrhi.* This kind of hardening must not be confounded with the equal whitish scirrhous and tubercular hardening.

§ 60.

MORBID OSSIFICATION, *ossificatio seu osteogenesis præternaturalis,*[1] presents indeed very different degrees of hardening, but in general less than that of the ordinary bones, so that the diseased mass is but in a cartilaginous, (CARTILAGINATION,) fibro-cartilaginous or horny-like pliable state.[1*] In other cases the proportion of earth to the animal parts is more favourable, and the morbid growth has the accidental composition, consistence, and, in rarer cases, also the structure of true bones. If the earth be in still greater quantity, the mass more solid, gypsum-like, creaking when cut, and without any trace of organization, we properly call this disease PETRIFACTION, *petrificatio.*[2] Repeated inflammation, rickets, tubercular disease, syphilis, gout, and all the diseases by which an increased absorption of the earth of bones is produced, or the bony earth is removed, contrary to law, from one part and morbidly deposited in another, must be considered as the principal causes of morbid ossification. A general or local debility of the living power seems always to precede ossification; it therefore occurs at a later period of life, and although it may be found in almost all the systems and parts of animal bodies, yet it occurs most frequently in the torpid parts of the organism.[3] A general and uniform penetration of the normal substance of an organ with bony accretion,[4] or a true conversion of the tissue, rarely occurs; more frequently is the extraneous matter collected merely on single spots, and more loosely connected with the normal tissue,[5] is then of very different forms, viz. as numerous isolated specks, as drops of cartilaginous and bony substance running as it were out of each other, and coagulated, as larger or smaller thin plates,[6] or as more roundish, thicker, but often also as angular and unequal pieces, &c.[7] We also see not unfrequently in the cavities of the joints, in the mucous bags, in diseased synovial bags, in the vaginal membrane of the testicles, also in the pericardium, in the membranes of the chest and belly, one or several LOOSE, MOSTLY ROUNDISH CARTILAGES, OR BONY AND STONE-LIKE CONCRETIONS, which in the beginning, always, and also commonly in later years,

are attached by threads or necks, and seem to be contained in a kind of bag, of which the neck is subsequently ruptured.[8]

(1) *Salzmann* D. de ossificatione præternaturali. Argent. 1720.—*Schacher* Pr. observ. circa materiam ossificationis præter naturam factæ. Lips. 1726. v. *Haller's* Coll. Diss. Part VI. No. 205.—*Vater* D. de osteogenia naturali et præternaturali. Viteb. 1726. v. *Haller's* Coll. Diss. Part VI. No. 206.—*Vater* D. de ossificatione præternaturali. Viteb. 1728,—*de Haller*, Pr. de ossificatione, ut vocant præternaturali. Gött. 1749, and Element. Physiol. Vol. VIII. Part II. p. 78.—*Hoernigk* l. c.—Konigl. Vetenskaps Academiens Handlinger, Vol. XI. p. 12.—*Sandifort* in Observat. anat. pathol. lib. III. cap. II. p. 42.—*van Heekeren* D. de osteogenesi præternaturali. 4to. Lugd. Batav. 1797, with engr.—*Penada* in Saggio di osservazioni, etc. P. II. p. 36. Padua, 1800.—*Meckel* Handb. d. pathol. anat. Vol. II. Part II. p. 160. — [*L. V. Brugnatelli* Litologia Umana, Ossia Ricerche chimiche e mediche sulle Sostanze petrose che si formano in diverse parti del corpo umano, etc. fol. Pavia, 1819. T.]— *Cruveilhier*, P. II. p. 1.—*Gerardin* Essai sur les phlogoses sarcopée et osteopée, ou l'inflammation considérée dans ses deux seules terminaisons, la sarcose et l'ostéose. 4to. Paris, 1828. — *Rayer* in Archives générales de Médecine, March and April, 1823.—Concerning the chemical analysis, v. *Duncan*, jun. in Edinb. med. and surg. Journ. Vol. I. p. 407.—*John* Chem. Tabellen des Thierreichs. fol. p. 60. Berl. 1814.—[*J. B. Boyer* De Suppuratione et curatione inflammationis per suppurationem terminandæ. 8vo. Monsp. 1766.—*Andral* Précis d'Anat. Path. Vol. I. p. 388. T.]

(1*) [*G. Andral*, Précis d'Anat. Pathol. Vol. I. p. 275. T.]

(2) The earth which is collected in morbid ossification, is in general phosphate of lime; but in GOUTY CONCRETIONS, *Tophi* make an exception to this, as they consist of urate of soda. *Tennant* first discovered this. v. *John*, p. 59.—*Wollaston* and *Fourcroy* confirmed it. Not unfrequently, such earths are poured out in great quantities in the urine, sweat, ulcers, spittle, &c. We also sometimes find it collected as a whitish thickish pap, as a viscid chalk in the thyroid and bronchial glands, under the inner coat of the arteries, and in other places.

(3) For instance, cartilage, fibrous parts, cellular tissue, serous membranes, glands which have been emaciated or destroyed by disease, arteries, encysted tumours, dead hydatids, sarcom, even the dead child, with its membranes, if it have been retained for a long time in the mother's womb;—in many instances, this ossification is a fortunate effect of the healing process. It appears, in general, to occur more frequently in the male than in the female organism.

(4) Perhaps only in cartilage and in tendinous parts.

(5) In these cases we are accustomed to distinguish the morbid formations by the names *concrementa ossea, lapidea*, &c.; if they lie very loosely, they form the transition to stones, which have no organic connexion with the body.

(6) Thus it appears most frequently in and between the membranes, and then sometimes produces a kind of hard crust around an organ.

(7) These lie usually in the parenchyma of an organ, and in the loose cellular tissue, although sometimes not far distant from the surface of membranes; for example, of the peritoneum, the pleura, and the inner surface of the dura mater, &c. and then, by their sharpness and irregularity, irritate the neighbouring organs. Here also belong the very common, and oftentimes very large, fibro-cartilaginous tumours in the substance of the womb.

(8) *Laennec* in Dict. des Sc. médical, Vol. IV. p. 123.—*Cassan* in Archiv. général de Médec. May, 1826. — *Wardrop* in Edinb. med. and surg. Journ. Vol. IX. p. 14.—*Fuhrmann* D. de tumoribus cysticis humorem synoviæ similem et corpuscula cartilaginea continentibus. Jenæ, 1822. — Compare the several parts in *Cruveilhier* in Archiv. général de Médec. Jan. 1824.

§ 61.

The most unfavourable termination of inflammation is MORTIFICATION, *gangræna, sphacelus, sideratio, mortificatio*,[1]

(1) Compare with reference to Literature, *Reuss* Repertor. commentat. Vol. XIII. p. 365—383. — *Ploucquet* Repertor. Art. Gangræna & Sphacelus. — *Maitland* D. de gangræna. Edinb. 1775. — [*F. Quesnay* Traité de la Gangrene. 8vo. Paris, 1749.—*Vic d'Ayr* Suite des observations sur les concretions animal, in Hist. de la Soc. Roy. de Méd. 4to. Vol. IV. p. 279. Paris, 1779—98. T.]—*Himly* Abhandl. über den Brand der weichen und harten Theile. 8vo. Gött. 1800.—*Neumann* Abhandl. vom Brande und Heilsmethode desselben. 4to. Wien, 1801. — *Leslie* D. de gangræna contagiosa. Edinb. 1804.—*Johnston* D. de gangræna contagiosa nosocomiali. Edinb. 1805. — *Heffter* Doctrinæ de gangræna brevis expositio. Lips. 1807.—*Lassus* Pathol. chir. Edinb. 1809, Vol. I. — *Liesching* D. de gangræna. 4to. Gött. 1811.— *Thomson*, Lectures on Inflammation, &c. 8vo. Edinb. 1813. — *Brugmann* Den Hospitalbrand. — *J. Delpech* Mém sur la complication des Plaies et des Ulcères connue sous le nom de Pourriture d'Hôpital. 8vo. Paris, 1815.— *Gerson* Ueber den Hospitalbrand, etc. 8vo. Hamb. 1817. — *Ericson* præs. *Akerman* Observationes circa gangrænam. 4to. Upsal. 1817. — *Hilson* D. de gangræna nosocomiali. Edinb. 1818.—*Brauer* Observat. quædam de gangræna nosocomiali. 4to. Lips. 1820. — *Henzschel* D. de gangrænæ atque sphaceli natura, indole et curatione. 4to. Lips. 1821. — *Gregory* D. de gangræna nosocomiali. Edinb. 1822.—*Arnold* D. de gangræna. Landishut. 8vo. 1823.— *Hancke* Ueber den heissen und kalten Brand, etc. Einladungsprogramm. 8vo. Breslau, 1826. — *Renard* Ueber hospitalband. Mainz, 1815. — *Dussaussoy* Dissertation et observations sur la gangrène des hôpitaux, etc. Lyons, 1807.— *C. P. Hilsenberg* D. de gangrenâ nosocomiali. 8vo. Berol. 1828.

(2) Old age, scarlet fever, measles, and erysipelas dispose to mortification; so also syphilis, the mercurial disease, the contagion of typhus, &c. It very commonly arises from burns, or severe cold; further, from the cessation of the circulation in a part; also from ligature, compression, or stoppage of the large blood-vessels; very commonly also from continued pressure of very tight ligatures, from the pressure of a tourniquet in the cure of aneurism; from continued lying on a part; hence the wounds produced by lying, DECUBITUS, on the sacrum, edges of the hip bones, the blade bones, and heels, in long continued illness, with great weakness of the living powers. Aneurism of the heart, and large vessels, sometimes cause mortification of the limbs.

(2*) [An instance of mortification of the cheek, consequent on hooping cough in a child, has lately occurred in St. Thomas's Hospital. She died in nineteen days from the commencement of the attack. T.]

(3) For example, soft juicy parts are much more easily destroyed by mortification than hard parts, as tendon, cartilage, and bone; in the latter, this disease is named NECROSIS.

(4) *Boyer*, in his Treatise on Surgical Diseases, Vol. I. improperly calls the mortification, which does not penetrate beyond the skin and subjacent cellular tissue, GANGRÆNA, and that which penetrates deeper into the flesh, and to the bones, SPHACELUS.

(5) *Pott* Obs. on the mortification of the toes and feet in Chir. Works. 8vo. Vol. III. Lond. 1791.—*Cooper*, in Phil. Transact. Vol. XXIII. p. 1195; Vol. XXIV. p. 1970.—*Thomson*, p. 537.—*Hodgson*, Treatise on the diseases of arteries and veins, &c. p. 65. 8vo. Lond. 1815.—*Bauer* in der Dresdner Zeitschrift f. Natur-und Heilkunde. Vol. II. Part II.—*Weinech* D. de gangræna senili. 8vo. Halæ, 1821. I have seen a man, about thirty years of age, who had lost by this disease all his toes and fingers, his ears, and a part of his heels. I have seen this disease sometimes produced by vices of the heart. The mortification which arises, after living on blighted corn, is very similar. v. *Dodard* in Journ. des Savans. 1676. — *Noël* in Mém. de l'Academ. des. Sc. 1710.—[In the Medical Museum, 1763, Vol. I. p. 442, a very interesting history is given, by *Dr. Woollaston*, of a whole family, who were all affected with mortification of the legs, in consequence, it was believed, of eating bread made with bad corn, (it being then, 1762, a time of great scarcity;) and also, that the mother and her six children were all affected within three days, and the father in a fortnight after. T.] *Langius* Descriptio morborum ex esu clavorum secalinorum Campaniæ. Lucern,

1817.—*Pessier* in Mém. de la Soc. royal de Médec. Vol. I. and II.—*Prescott*, On the natural History and medicinal Effects of the Secale cornutum, or Ergot. London, 1813. See the observations on Raphany. — [Raphany, or Kriebelkrankheit, as the Germans call it, is a disease produced, it is believed, by eating the bastard radish. T.]

(6) We find in the midst of carbuncle, a viscous mortified core, the skin also covering it is at the beginning, perforated by ulceration like a sieve, and sometimes many holes are formed near each other, like a wasp's nest, whence the term *vespajus* is applied to it. Compare *Guidetti* and *Malvani* in Journ. général de Médec. No. 294.—*Fosbrooke* in Edinb. med. and surg. Journ. Jan. 1821. — *Kopp* gives a good plate of carbuncle in the Jahrb. der Staatsarzneik. Jahrg. VI. 1813, p. 96. — Very many authors in *Ploucquet* Repertor. Art. Anthrax. — *Callisens* System Chirurgiæ hodiernæ. 2 vols. 8vo. Hafn. 1824. — *Hoffmann* D. de Anthrace. 8vo. Halæ, 1820. — *Hoffmann* in *Rust's* Magazin f. d. ges. Heilk, Vol. XXI. Part I. p. 70. — *Erdmann* Annales Scholæ clin. Dorpartensis, 1818—20, and in *Horn's* Archiv f. medic. Erfahr. 1822, Jan. Febr. p. 182.—*Hoffmann* der Milzbrand oder contagiöse Carfunkel der Menschen u. s. w. 8vo. Stuttgart, 1827. — *Pagliati* Sopra un vastissimo Antrace, memoria teoretico-practica. Messina, 1821.—*Krahn* D. de pustula maligna. 8vo. Berol. 1826.—*Helbich* D. de carbunculo polonico. Berol. 1827.—*L. Schrader* Ueber die natur des Milzbrandes der Thiere des Milzbrandcarbunkels bei den Menschen, &c. 8vo. Magdeburg, 1828.—*C. F. Schroeder* Ueber die schwarze Blatter in *Rust's* Magazin, Vol. XXIX. Part II. p. 236.

(7) *Eyselius* D. de nomis. Erf. 1701.—*van Swieten* Comm. in *Boerhav.* Aphor. Vol. I. p. 749—766. Vol. IV. p. 746.—*Bierchen* Abhandl. von den wahren Kennzeichen des Krebsschadens. Gött. 1775.—*de Meza* in Act. Reg. Soc. med. Hafn. Vol. II. No. 7.—*Thomassen* à *Thuessink* in *Geneeskond. Magazyn.* Vol. III. Part III. No. 13.—*Pittschaft* in *Hufeland's* Journ. d. prakt. Heilk. 1821. Part VI. p. 14. — *Klaatsch ib.* Jan. and Feb. 1823. — *Reimann* D. de nomate, etc. 8vo. Berol. 1824.—*E. Thompson*, On the gangrenous erosion of young children, in Lond. Med. and Phys. Journ. June, 1827.—*A. L. Richter* Der Wasserkrebs der Kinder, a monograph, with two plates. Berl. 1828.

§ 62.

A remarkable consequence of mortification which does not prove mortal, is the SEPARATION OF THE DEAD PART FROM THE REST OF THE ORGANISM.[1] This is effected by a fresh inflammatory swelling of the living parts, whilst the dead fall together, are distinctly bounded by an ulcerated groove, at first well marked by a white line, and subsequently by elevation of the skin and by suppuration. The skin and cellular membrane separate first, next the muscles, nerves, and vessels, the latter of which are found partly plugged by coagulated blood, partly closed by active adhesive inflammation, and therefore no blood escapes—and at last, the tendons and bones also, so that sometimes the whole limb is thrown off spontaneously.[2] If the bones, cartilages, and tendons, be only partially destroyed, layers of greater or less thickness separate from their surface, EXFOLIATION, *exfoliatio*, which retain the form of the part; in the soft formations, however, this occurs very seldom, and is only observed in parts composed of several layers or coats.[3] In rare instances also, cancerous tumours, sarcoms,

polyps, and other growths, are separated by mortification, and even entirely cured.[4]

(1) Compare § 46.

(2) *Ploucquet* Repertor. Art. Necrosis; also *Aepli* in *Hufeland's* Journ. d. prakt. Heilk. Vol. XXV. Part III. p. 136.—*Springfield* Nov. Act. Acad. Nat. Cur. Vol. III. p. 464.—*Gignoux* in Mem. de l'Acad. Chir. Mém. Vol. V. p. 778. — *Pyaloux*, *Ibid.* Vol. II. p. 477. — *Butschka* in Badischen Annalen f. d. gesammte Heilkunde, Jahrg. II. Part I. p. 110; also both legs at the hip joint, —*Noel.*—Both arms at the elbow joint. v. Mém de Paris, An. 1703. Mém. p. 41. Most frequently the foot at the calf. Two instances of this kind have been given by *A. Cooper*, Principles and practice of Surgery, edited by *Tyrrel*, Vol. I. p. 216 and 226; and another by *Bleuland* in Genees-natuur-en Huishoud-kundig Kabinet van *Voegen van Engelen*, Part II.

(3) So also large pieces are lost by mortification, from the mucous membrane of the alimentary canal, or of the urinary organs.

(4) See several instances in *Cruveilhier* Essai sur l'Anatomie Pathol. Vol. I. p. 127. I have, a short time since, observed a complete spontaneous separation, by mortification, of a large sarcom from the shoulder; after some time, however, it was reproduced.

§ 63.

The last kind of vice of texture, which occurs in consequence of inflammation or a similar state, depending on a greater degree of plasticity, is not, as the already mentioned vices, a morbid change of the normal part of the organism, but the FORMATION OF NEW SUBSTANCES EITHER NOT previously existing AT THIS PARTICULAR SPOT, OR GENERALLY NOT IN THE BODY, which are called SPURIOUS FORMATIONS, *pseudoplasmata, pseudorganisationes*,[1] and as they also usually produce local swellings, must be numbered among TUMOURS, *tumores, phymata*.[2] Some of these spurious formations are accurately separated from the normal parts, are of a non-malignant character, and with reference to their texture, sometimes in a measure resemble the natural tissue[3]—others are less defined, have a disposition to seize upon and destroy the neighbouring parts, are at first hard, but gradually soften, are all more or less of a malignant kind, and in their texture have but little resemblance to the natural tissues. To the former kind belong the ENCYSTED SWELLING, to the latter TUBERCLES, SARCOMA, and CANCER, all of which must be here particularly treated of.

(1) v. *Clarus*, *Cruveilhier*, *Junge*, Sect. 55, note 7.—*von Olfers* de Vegetativis et animatis corporibus in corporibus animatis reperiundis Comment. 8vo. Vol. I. Berolini, 1816. — *Casper* Zur Lehre von den Afterorganisationen in *Horn's* Archiv f. med. Erfahr. 1821. Nov. Dec. p. 385.—*Heusinger* first Bericht von d. königl. anthropotomischen Anstalt zu Würsburg. 4to. 1826. p. 9. ff. — *Ritgen* Pathologie u. Therapie der Afterbildungen. Berl. 1828, and in *v. Graefe* and *v. Walther's* Journal f. Chir. u. Augenheilk. 1828. Vol. XI. Part I. p. 1. Part II. p. 181—229. Part III. p. 405. — *Meyer* Untersuchungen über die Natur parasitischer Geschwülste im Mensch. Körper, etc. 8vo. Berl. 1828.—[*Andral*, Vol. I. p. 478. T.]

(2) *Reuss* Repertor. Comment. Vol. XV. p. 25, ff.—*Plouquet* Repert. Art. Tumor.—*Severinus* de recondita abscessum natura. 4to. Francorf. 1613.—*de Sauvages* D. Theoria tumorum. Monsp. 1753.—*Astruc* Traité des tumeurs et des ulcères, Paris, 1759. translated into German by *Rumpelt.* Leipz. 1761. with remarks and additions by *Hebenstreit.* 3d edit. 1805. 2 Parts.—*Bertrandi* Abhandl. v. d. chir. Operation. 8vo. Nizza, 1763.—Opere. 8vo. Turin, 1786. Vol. I. II.—Abhandl. von den Geschwülsten. deutsch von *Spohr.* 8vo. with plates. Leipz. 1788. *van Gesscher* Proeve over de voornaamste langduurige Gezwellen. 8vo. Amst. 1767.—*Plenk* Novum systema tumorum, etc. 8vo. Vienn. 1767.—*J. Bell* The principles of Surgery, as they relate to wounds, ulcers, &c. 4 vols. 8vo. London.—*Abernethy,* Surg. Observat. &c. Lond. 1804.—*Ib.* Surgical Observations on tumours and on lumbar abscess. 2 vols. 8vo. London, 1827.—*Pelletan* in Clinique chirurgicale, etc. Vol. I. Paris, 1810.—*Crane,* in Edinb. med. and surg. Journ. Vol. IX. p. 409.—*Baron,* An inquiry illustrating the nature of tuberculated Accretions of serous membranes, and the origin of Tubercles and TUMORS in different textures of the body. 8vo. London, 1819.

(3) The resemblance of such spurious formations to healthy parts and tissues of the body, which especially *Laennee,* in Journ. de Médec. par *Corvisart,* etc. Vol. IX., Pluviose; and in Dict. des Scienc. médical, Vol. II. p. 46—61.; *Fleischmann,* in Leichenöffnungen, Erlangen, 1815, p. 111, and many others, have pointed out, is however but little in an anatomical view, as will be seen in the following observations.

§ 64.

The ENCYSTED OR BAGLIKE TUMOURS, *tumores cystici, tunicati, cystides, lupiæ,*[1] are equally common spurious formations both in men and animals, originate one or more at a time in almost all parts of the body, in consequence either of a general disposition, or of mechanical causes; still, however, their especial seat is in the cellular membrane beneath the skin. They are composed of an external perfectly closed cyst, which secretes the substances contained within,[2] and may be of a very different thickness and texture. Sometimes it is extremely thin, and merely resembles condensed cellular tissue; in other cases it is firmer, and has some similarity to serous,[3] fibrous, or mucous membranes; it may also consist of many layers, has naturally but few and small blood-vessels and often none at all, in which latter case it seems nourished merely by absorption. Usually these encysted tumours lie loosely in the surrounding cellular membrane, although they are sometimes more firmly connected to the neighbouring parts, if by their pressure they have given rise to inflammatory irritation; mostly they present a roundish, smooth, though sometimes also, if lying between unyielding parts, a more compressed form, and an endless variation of size, acquiring a diameter even of several feet, which sometimes remains the same for a long period, at other times increases more or less quickly. They rarely disperse of themselves; if artificially emptied, they soon fill again; should they be only partially removed, they soon attain their former size; sometimes, if they be much irritated, they run into fungous, cancerous destruction; the

cysts frequently become bony, and then cease to grow. The contents of these encysted tumours differ very much; as a general rule, however, they always consist of inorganic, fatty, or lymph-like fluids. If they contain animal fat, they are called LARDY or FATTY TUMOURS, *lipoma, steatoma;*[4] if they contain a clearish serous fluid, and the bag itself is no where attached, but loosely enclosed in the tissue of the organ, in the cavities of the body, or in their own more common capsules, they are called HYDATIDS, *hydatides;*[5] should the fluids be similar, whilst the sacs are firmly attached, as other encysted tumours, they obtain the name *hygroma, tumor serosus, lymphaticus, cystis serosa, hydrops saccatus, &c.;*[6] if they contain a thicker substance similar to the lubricating fluid of joints, they are called SYNOVIAL TUMOURS, *tumores synoviales, or ganglia;*[7] finally, if the contents be more or less coagulated and granular, such are called GRANULAR TUMOURS, *atheroma,* or HONEY-LIKE TUMOURS, *meliceris,*[8] &c. We not unfrequently find also besides the substances already mentioned, hairs,[9] pieces of bone, and teeth[10] in encysted tumours.

(1) Compare *Reus* Repertor. Comment. Vol. XV. p. 29. — *de Plouquet* Repert. Art. Tumor cysticus.—*Littre* in Mém. de Paris, A. 1709. Hist. p. 22.—*Lafaye* in Mém de la Soc. de Méd. pr. de Montpellier, Vol. XXXII. p. 340.—*Slevogt* D. de tumoribus tunicatis, Jan. 1719.—*Salzmann* D. de quibusdam tumoribus tunicatis externis, Argent. 1719, in HALLERI Coll. Diss. chir. Vol. V. No. 150.—*Fitzgerald* D. de tumoribus tunicatis. Monsp. 1733.—*Gouraigne* D. de tum. tunic. 4to. Monsp. 1733.—*Heister* D. de. tumor. cyst. singularibus. Helmst. 1744. — *Rey* Traité de tumeurs encystés. 8vo. Bruxell. 1752.—*Girard* Lupiologie, ou Traité des tumeurs connues sous le nom de loupes. Paris, 1775.—*Chopart* Essaie sur les loupes, in Prix de l'Acad. de chir. 4to. Vol. IV.—*Chambon* Mémoires sur les loupes. *Ib.* — *Pohl* D. de tumorum tunicatorum genesi. Lips. 1778.—*Klose* D. de tumor. cyst. Duisb. 1790.—*Loder* D. de tumor. cyst. Jenæ, 1791. — *Jacobsen* D. de tumor. cystic. 4to. Jenæ, 1792. — *Abernethy.*— *Boudet* Essaie sur les loupes. 4to. Strasb. 1806.—*Akerman,* resp. *Ekelund* D. de tumore cystico. Ups. 1817. — *Munch* D. s. animadversiones nonnull. de tumor. cyst. etc. Wirceb. 1818, with plates.—*A. Cooper* and *Travers,* Surgical Essays, in Two Parts.—v. *Walther* in his and *Graefe's* Journ. d. Chir. u. Augenh. Vol. IV. Part III. p. 379—399. — *Fuhrmann* D. s. varior. auctor. observata de tumor. cysticis, etc. Jenæ, 1822.—*Schaefer* D. quædem de tumor. cyst. 4to. Lips. 1825.—*Bricheteau* in Dict. des Sc. médic. Art. Kyste. Vol. XXVI. p. 13.—*Manfalcon, ib.* Art. Lupia. Vol. XXIX. p. 76.—*Adam's* Opinion, who considers all encysted tumours as inferior animals, as hydatids, v. On the cancerous breast. London, 1801. [*E. Bisset,* M. D. Observations on lymphatic and encysted tumours, in Medic. Comment. Vol. IX. p. 244.—*Andral,* Précis, Vol. I. p. 242, &c.—*Thos. Hodgkin,* M. D. On the anatomical characters of some adventitious structures, in med. chir. Trans. Vol. XV. p. 272. T.] I have seen several in the horse, cattle, dogs. At Alfort, one from a horse weighing fifty pounds; moles, and the swellings on the elbows of horses, are very often encysted; *Rigot* Ueber die Balgbildung in den Thieren. Recueil de Médec. vetérin. par *Girard* T. V. April, 1825. p. 169.—*Delpech* in Chir. clinique de Montpellier, Vol. II. Paris, 1828. (Twenty-third Observation.)

(2) In this respect they differ from the false encysted tumours, which are

little hydatids, which either swim in the fluid, or sprout from the internal surface of the large hydatid. Compare as to Literature, *Reuss* Repert. Comment. Vol. XIII. p. 480.—*de Plouquet* Repert. Art. Hydatis, and on the individual parts. *Hunter*, in Transact. of a Soc. for the improv. of med. and chir. Knowledge. Vol. I. p. 34. London, 1793.—*Veit* Einige Bemerk. über die Entstehung der Hydatiden, in *Reil's* Archiv. f. die Physiol. Vol. II. p. 486.—*Rudolphi* Entozoorum s. verm. intestinal. hist. nat. Amstel. 1808—10, 2 vols. 8vo. in several passages.—*Ludersen* Dis de hydatidibus. 4to. with a plate. Gött. 1808.—*Himly* in his and *Hufeland's* Journ. der prakt. Heilk. Dec. 1809, p. 140. — *A. Monro*, An Essay upon the Hydatids of the human body. 8vo. Edinb. 1811. — *Meckel* Handb. d. pathol. Anat. Vol. II. Part II. p. 394. — *Fosbroke* in Lond. med. Repository, Vol. XXI. No. 122—125. — *Baron*, an Inquiry, illustr. the nature of tuberculated accretions of serous membranes, &c. 8vo. Lond. 1819.—*J. Carlevarius* D. de hydatidum origine et mutationibus successivis. 8vo. Savona, 1825. — Encysted tumours, containing hydatids are often enormously large, particularly in the belly; for some examples of such cysts in the general cellular tissue of the body, v. *Reuss* and *Plouquet*. — *Janin* in *Sedillot* Recueil period. Vol. XXIII. p. 254.—*Bisset* in *Duncan* med. Comment. Dec. I. Vol. IX. p. 244.—*Baird*, in Edinb. med. and surg. Journ. July, 1821. — *Otto* Verzeichn. der Bresl. anat. Präparatensammlung. No. 2077 and 2078. They are not unfrequently discharged in various ways,—they also ulcerate. v. *de Plouquet* Art. hydatis ex ulcere. — *Bisset*. — *J. Carlevarini* D. de hydatidum origine et mutationibus successivis. 8vo. Paris, 1825. — Opinion of the older writers on the origin of dropsy from rupture of hydatids.

(6) *Reuss* Repertor. Comment. Vol. XIII. p. 547.—*de Plouquet* Repertor. Art. Hydrops cysticus et hydatidosus.—*Salzmann* D. de tumoribus quibusdam, serosis externis. Argentor, 1719. — *Morgagni* De sed. et caus. morbor. Epist. XXXVIII. p. 63, seq.—*Cruveilhier* Essay sur l'anat. pathol. Vol. I. p. 256—296.—*Meckel* Hand. der pathol. Anat. Vol. II. Part II. p. 144—158. They occur most frequently, and are largest in the belly. Compare the several places.

(7) As they are really situated in the neighbourhood of joints and tendons, so are they mostly diseases of the mucous bags (bursæ mucosæ vaginales, vesiculares subcutaneæ). Compare those in *Cruveilhier*, Vol. I. p. 296 and 303. *Meckel*, Vol. VIII. Part II. p. 15.—*Fuhrmann* D. s. varior. auctor. observata de tumoribus cysticis humorem synoviæ similem et corpuscula cartilaginea continentibus. Jenæ, 1822.

(8) *Schmidt* D. de atheromate manu curato. Halæ, 1798.—*Reuss* Repertor. Comment. Vol. XV. p. 33, 34.—*de Plouquet* Art. Atheroma et Meliceris. [This secretion is considered by *Andral*, Vol. I. p. 440, to be merely a variety of *Laennec's* ' matiere colloïde.' T.]

(9) Generally, in fatty tumours, the hair resembles the normal hair of animals; as wool in sheep, feathers in birds. — *de Plouquet* Repertor. Art. Pilus in insolitis locis. — *Meckel* Ueber regelwidrige Haar-und Zahnbildung in the Archiv f. d. Physiol. Vol. I. p. 519 ff. and Handb. d. pathol. Anat. Vol. II. Part II. p. 270. — *Cruveilhier*, Vol. II. p. 166 and 181. — *Hoffmann* in Ephem. N. C. Dec. II. A. V. p. 433. Ann. VIII.—*Wepfer* Pæon et Pythag. Ann. XI. p. 53.—*Hunter* s. *Baillie*, in Phil. Transact. Vol. LXXIX. p. 77.——*Malpighi* Opera posth. p. 95. — *Ruysch* Thes. anat. Vol. VI. Tab. VI. fig. 5 and 6.—Recent Observations are in the American medic. Recorder. Philad. Vol. I. No. 3.—*A. Cooper* and *Travers*, Surgic. Essays, P. II. — *Delpech* Précis des maladies reputées chirurg. Vol. III. p. 412.—*Zethermann* in *Hufeland's* and *Himly's* Journ. d. prakt. Heilk. July, 1811, p. 121.—*Bricheteau* in Journ. compl. du Dict. des Sc. médic. Vol. XV. p. 298.—*Denis* in Journ. de Méd. Chir. et Pharm. milit. par *Biron* et *Fournier*, Vol. II. p. 357. — *Tainturier ib.* Vol. XI. p. 271. — *Bobillier ib.* p. 273; from a horse; v. *Rudolphi's* Bemerkungen auf einer Reise u. s. w. Part I. p. 80. Berlin, 1804. — In the Hunterian Museum at London, I saw two encysted tumours completely full of hair, from a cow; also another similar one under the skin of the head in a calf.—*Otto* Seltene Boebacht. Part II. p. 159. — v. Bresl. Mus., No. 388. — Three steatomes, with feathers from a goose and hen, *ib.* No. 2096 — 2098. Encysted tumours, with

hair, were described in *Bartholinus* Cent. I. Hist. 100.—Acta Hafn. Vol. II. p. 40.—Mémoir de. l'Acad. 1731, p. 450, &c.

(10) *Meckel.* Compare the several places.

§ 65.

Still more common and also more malignant than the encysted, are SCROFULOUS TUMOURS, TUBERCLES and LUMPS, *scrofulæ, tubercula, nodi, strumæ,*[1] a disease which is sometimes congenital, but is especially common in children, though frequent also in manhood, even in later years also under certain forms, and first originates in inflammatory and dyscracic irritation. The essential character of this proteus-like disease is the formation of an inorganized, transparent, crumbling substance, consisting principally of albumen and animal lime,[2] which, excepting the horny structures, is found deposited in all the systems and parts of the body, often in many of them at once and in great quantity.[3] The form of the spurious formation produced by the scrofulous disease is very various; commonly indeed it produces on the parenchyma of an organ, more or less numerous, little, roundish, greyish white bodies, which at first are transparent, but gradually become opake; sometimes they are more flat and irregular little excresences, of the same substance however, upon the surface of serous and mucous membranes; whilst, in other instances, the scrofulous matter is deposited in the cellular tissue of very different parts in undefined masses, and then produces a whitish hardening, devoid of vessels, which must not be confounded with that arising from inflammation or scirrhus;[4] lastly, we not unfrequently find the scrofulous matter contained in distinct bags[5] composed of cellular tissue. These various forms of scrofula have this general property, that at first they are small, hard, and contain but little lime, that by degrees they increase very much, usually become soft in the middle, and then contain a yellowish-white, crumbling matter, containing more lime, similar to new cheese. At this period the tubercles and the surrounding cellular tissue usually run on to inflammation[6] and suppuration;[7] sometimes, however, the scrofulous matter is removed by absorption, or the diseased structure is as it were destroyed by ossification. Not frequently from scrofula and its complication with other diseases, arise the various TUMOURS,[8] which even in certain cases, produce a gradual TRANSITION into SARCOMA and CARSINOMA.

The tubercular disease is very common in animals, particularly in domestic and foreign animals retained in captivity;[9] thus are the GLANDERS, MALIGNANT TUBERCLE, FARCY, and the *melanosis tuberculosa* of the horse, the GLANDER-LIKE

DISEASES of sheep and cattle, a kind of MURRAIN among dogs, the TUBERCULAR DISEASES in cattle, horses, and dogs, and other diseases, if they be not the same disease as scrofula, are still more nearly allied to it.

(1) *Reuss* Repert. Comment. Vol. XIV. p. 423 ff. Vol. XV. p. 45.—*de Plouquet* Repertor. Art. Scrophula.—Dict. des Science médical. Art. Scrophules.—*Bayle* in Journ. de Méd. Chir. et Pharm. par *Corvisart*, etc. Vol. VI. p. 3; Vol. IX. p. 285, et 427; Vol. X. p. 32.—*Lambe*, Inquiry into the origin, &c. of Scrofula, Consumption, Cancer, &c. 8vo. London, 1805.—*Robertson* D. de Scrophula. Edinb. 1809.—*Russel*, A treatise on Scrofula. Edinb. 1808.—*Baume* Traité sur le vice Scrophuleux. 8vo. Paris, 1808.—*Rogers* D. de Scrophula. Edinb. 1810.—*Armstrong*, Essay on Scrofula, &c. 8vo. London, 1812.—*Newsom* D. de Scrophula. Edinb. 1814.—*Henning*, A critical inquiry into the pathology of Scrofula. 8vo. Lond. 1815.—*Carmichael, W. Goodlad*, A practical essay on the diseases of the vessels and glands of the absorbent system. 8vo. Lond. 1814.—*Le Pelletier* Traité complet sur la maladie scrofuleuse et les différents variétés qu'elle peut offrir, etc. 8vo. Paris, 1818.—*Baron*, An inquiry illustr. the nature of tuberculated accretions of serous membranes, and the origin of Tubercles and Tumours in different textures of the body. 8vo. Lond. 1819, and Illustrations of the inquiry respecting tuberculous diseases. 8vo. with 5 plates. Lond. 1822.—*Farre* on Scrofula. 8vo. Lond. 1820.—*E. A. Lloyd*, A treatise on Scrofula, describing the morbid alterations it produces in the structure of all the different parts of the body, &c. London, 1821.—*Steyer* D. de morbo scrofuloso inprimis adultorum. 4to. Lips. 1821.—*Keddle* D. de Scrophula. Edinb. 1821.—*Orr* D. de Scrophula. Edinb. 1821.—*Macher* Ueber die Ursachen und das Wesen der Scrofelkrankheit, u. s. w. 8vo. Wien, 1821.—*Adelson* D. s. casum singularem morbi tuberosi. 4to. with plates. Gött. 1822.—*Home*, D. de Scrophula. Edinb. 1823.—*Alison*, Observations on the pathology of scrofulous Diseases, &c. Edinb. 1820.—*Abercrombie* in Transact. of the med. chir. Soc. of Edinb. Vol. I. p. 682, 1824; v. also *Freudenberg* D. de tuberculorum in hepate et pulmonibus causis atquæ cura. 4to Bonnæ, 1824, and *Laennec* De l'auscultation médiate, etc. Vol. I. p. 9. 8vo. Paris, 1819.—v. Opinions of *Morgagni* (de sedib. et caus. morbor. lib. III. Epist. XXXVIII. p. 35.) *Adam* and *Baron*, that tubercles consist of burst hydatids.—*Hartmann* D. de tuberculorum præternaturalium natura et origine. Halæ, 1826.—*Lombard* Essai sur les tubercules. 4to. Paris, 1827.—*John Baron*, Delineations of the origin and progress of various changes of structure, &c. 4to. with plates. London, 1828.—*Alison* in Transactions of the Med. Chir. Soc. of Edinb. Vol. III. p. 1. 1828.

(2) According to *Abercrombie*, the secretion of albumen into the glands constitutes the disease, the same substance also produces tubercles in the lungs; but in the belly they contain a mucous-like extractive matter.

(3) I have many times observed in children, also in adults, and in m[illegible]ys, that there was scarcely a part free from tubercles.

(4) The peculiar scrofulous matter which can be squeezed out by violent pressure, may be often distinguished with certainty; besides there is wanting the coagulated fibrine and sinewy fibres of inflammatory and scirrhous hardening.

(5) These bags are formed merely of loose cellular tissue compressed together, and are very different from encysted tumours; the thick tough cysts which we sometimes find around scrofulous VOMICÆ in the lungs and scrofulous glands, are produced partly by exsudative inflammation, partly in the latter instance by nothing more than the outer not yet dissolved substance of the organs.

(6) On these points, notice particularly *Thompson*, Lectures on Inflammation, and *Burns*, Dissertation on Inflammation, Vol. II. I could never discover vessels in tubercles, but I have very frequently seen them surrounded by a very red and vascular layer of the organ containing them.

(7) Most of the glandular suppurations, the common suppurative consumption of the lungs, and the various kinds of PHTHISIS ABDOMINALIS belong here.

(8) *Stark* D. s. scrofulorum naturam præs. steatomatosarum, causu rariori

adjecto et tabul. æn. illustrato. 4to. Jenæ, 1803. — *Hebréard* Essai sur les tumeurs scrophuleuses, etc. 8vo. Paris, 1803.—*Calvert* D. de tumoribus scrophulosis. Edinb. 1804.—*Hamilton*, Observations on Scrophulous Swellings in Edinb. med. and surg. Journ. Vol. V. p. 363.—*Alibert* Description des maladies de la peau. p. 228. (scrophule cancereuse) Pl. 48.—*Adelson*, Vol. I. and II.

(9) *Dupuy* De l'affection tuberculeuse, vulgairement appellée Morve Pulmonie, Gourme, Farcin, fausse Gourme, Pommelière, Phthisie du singe, du chat, du chien, et des oieaux domestiques. 8vo. Paris, 1817. According to him it occurs in the horse, cattle, sheep, swine, monkeys, dogs, cats, rabbits, hares, fowls, turkies; I have found it not merely in these, but also in the lemur, lion, coati mondi, wolf, seal, rat, guinea-pig, deer, roe, antelope, eagle, pheasant, and many domestic birds.—[*H. Bürger*, Veterinaire Diagnostik, p. 14, 3, 30. fol. Berl. 1830. T.]

§ 66.

A third and very important kind of spurious formation is the FLESHY TUMOUR or SARCOM, *sarcoma, sarcosis*,[1] which according to the difference of the tissue in which it is seated, the degree of its development, and its complication, assumes a series of various forms and textures, of which the general characters are principally negative, have moreover a near resemblance to flesh,[2] and a structure consisting of cellular tissue and albuminous-like fluids. Some are as malignant as cancer, with which they have otherwise many resemblances; but all, and even the most favourable of them, must be removed by chemical or mechanical means, in order that they should not become hurtful to the organism; all have a disposition, even though artificially removed, to be reproduced, and a morbid disposition to their growth is not, in most instances, to be mistaken. According to their form and consistence, they are now FLESHY EXCRESCENCES, *excrescentiæ carnosæ*,—now FUNGUSES, *fungi*, or POLYPS, *polypi*—or SARCOMATOUS SWELLINGS, *sarcomata*, in the strictest sense, without always being accompanied with definite characters. As vices of the external skin, here belong the various FLESHY EXCRESCENCES, the FIG-LIKE WARTS, *condylomata*,[3] the common FLESHY GROWTHS on the nose and generative organs, &c.; as vices of the mucous membrane, the *epulis* and POLYPS; in the bony system *osteosarcom;* in the fibrous organs, FUNGUSES, *fungi*; in the vascular system, the FLESHY GROWTHS ON THE INTERIOR OF THE HEART AND OF THE BLOOD-VESSELS, but particularly in the loose and parenchymatous cellular tissue, the TRUE SARCOM.[4] The latter usually produce tumours of a tolerable size, mostly roundish, although sometimes uneven, hilly, and extending by roots as it were among the neighbouring parts; always, however, bounded by a fine investing membrane or a layer of cellular tissue, whilst the tissue in which they grow is not connected with them, but only perforated or de-

stroyed by pressure. Their mass is at first toughish and close, mostly of a greyish red, although sometimes of a darker colour, and consists of much fine and soft cellular tissue, into which a more or less solid albuminous fluid is deposited, either loosely or in little sacs. They are not unfrequently divided into greater or less lobes, by processes of membrane, but are always connected immediately or by a kind of neck; they also contain small or large bags filled with fluid lymph, and may also be accompanied with hydatids and tubercular formations; their blood-vessels are at first few and small. From this firm, and at the same time, quiet state, in which they either do not increase at all, or only after a very long period, often, indeed, remaining so for many years,[5] they run spontaneously, or, if irritated, into an inflammatory excitement, increase then very quickly, become soft, acquire more blood-vessels, especially veins, and according to their situation take a very different course. Should they be found, indeed, in the intestines, they rarely burst externally, but increase to an astonishingly large size, and destroy by pressure on other organs, and by a peculiar weakening of the living activity; but should they lie under the common integuments, they destroy it by distension, break outwardly, and produce large fungous swellings, bleeding easily, and secreting lymph, which partly mortify and are thrown off, but are soon reproduced; lastly, if they have their seat in the tissue beneath the mucous membranes, they first elevate, and then perforating them, form on their open surface similar fungous tumours, which are called POLYPS, *polypi*,[6] and assume various colour, consistence, and form; the last are usually disposed to form cavities, in which they grow, although by their increased size, they destroy and extend themselves into the surrounding parts. Sarcoms and polyps are very rare in animals, and the former appear to exist but as sarcomatous growths on the testicles of some beasts.

(1) *Reuss* Repertor. Comment. Vol. XIII. p. 103. Art. Excresc.—*de Plouquet* Repertor. Art. Sarcoma.—*Grashuys* Exercitatio medico-chir. de scirrho et carcinomate, in qua etiam fungi et sarcomata pertractantur. 8vo. Amstel. 1741.—*De Gorter* D. d. sarcomate. Harderowyck. 1761.—*Bertrandi* Opere publ. dai *Penchienati* e *Brugnone*. Turin, 1786. p. 189.—*Abernethy*, Surgical Observations, &c. London, 1804.—*Meckel* Handb. d. pathol. Anat. Vol. II. p. 291. —Among the ancients, observations on sarcoma are mostly treated of under the name of Scirrhus.—*Abernethy* divides SARCOMA into S. commune, S. vasculosum, S. adiposum, S. pancreaticum, S. mastoideum, S. mammarium, S. tuberculosum, S. medullare, and S. carcinomatosum; of these, I have described the fatty sarcom among encysted tumours, as LIPOMA; the tubercular sarcom, at § 65, and the carsinomatous sarcom, at § 68, as cancer. Of the other kinds, the medullary sarcom is only to be distinguished in some degree, although it also corresponds, by its gradual transition, with the common sarcom; but the pancreatic and mammary sarcom of *Abernethy* have not the least resemblance

to the parts to which they are likened, and also gradually run into the usual sarcom. Sometimes all these kinds are found in one tumour. In *Abernethy's* private museum, at St. Bartholomew's Hospital, London, I could distinguish no particular kinds.

(2) Not of flesh, anatomically speaking, *i.e.* of muscle, but of flesh generally, soft parts, *i.e.* muscle, cellular tissue, skin, fat, and vessels together.

(3) *Fici, Mariscae*, etc. Compare *Wernher* D. de condylomatibus. Berol. 1826. —*B. Vossen* D. de condylomatibus venereis. 8vo. Berol. 1827.

(4) Besides those which I have recently had the opportunity of mentioning, I have observed and examined three sarcoms as large as the head; two on the thigh bone, the third on the left hip, and all three in males.

(5) One woman I knew who, for more than thirty years after she had a scirrhus removed from her breast, had a sarcom in her thigh, which, under more proper treatment, increased but little, and is still unbroken, although it has already several times seemed as if it would break.

(6) Comp. *Reuss* Art. Excrescentia polyposa. — *De Plouquet* Art. Polypus.— *Portal* in Mémoire sur la nature et le traitement de plusieures maladies. 8vo. Vol. III. Paris, 1800.—v. *Hecker* Annalen der ges. Medicin, etc. Vol. II. Part IV. No. 1.—*Eichhorn* D. de polypis. Gött. 1804.—*A. Monro*, On the Anatomy of the Human Gullet, etc. Edinb. 1811.—*Meckel*, p. 304.—*Cruveilhier* Essai sur l'anat. pathol. Vol. I. p. 388.—Polyps are not the loose ends of deeply situated sarcoms, into which they immediately run, as may be easily seen in the womb, as well also as in other parts. For instance, *Otto* Selt. Beob. Part II. No. 85, pl. 4, fig. 3; very properly may be here compared, *Palletta* in Exerc. pathol. Cap. I. and II. p. 2 and 9; some polyps with sarcoms; all polyps from mucous membranes originate in the subjacent cellular tissue, or in the periosteum; even subsequently we can trace their firm roots to these parts. The division of polyps into tendinous, fleshy and mucous, arises merely from the situations in which they are observed; if the mucous membrane be perforated, then they usually have only one narrow necklike root, sometimes two; hence they differ from the fungus of the mucous membrane, which consists only of the flocculence and growth of this membrane, and usually has a broad base.

§ 67.

The MEDULLARY SARCOM, *sarcoma medullare*,[1] is distinguished from the common sarcom by certain peculiarities of structure and progress, as, according to circumstances, a more or less distinct degeneration; it is, however, more malignant than the common sarcom, usually proceeds more quickly; if removed, it returns more readily; occurs in almost all parts of the body both primarily and secondarily, and especially in youth. From the very onset it is softer than the common sarcom, feels very elastic, and commonly so, as it contains fluids, and consists of a tolerably homogeneous, whitish, and softish mass, at first sight similar to the brain of children, cooked fish-spawn, or clotted cream; it also, at the same time, contains albumen, and is perforated in different directions by soft cellular tissue or membrane, by few, and for the most part, large veins, and frequently by more or less coagulated blood or its fibrine. When it bursts and forms a fungus, it presents many blood-vessels, especially veins, and secretes a yellowish green lymph; sometimes the fungus separates in

large pieces. Not unfrequently is the medullary sarcom connected with MELANOSE, in consequence of which, as well as by the addition of the clotted blood, the original white substance of the tumour is coloured, either completely or partially, yellowish, dusky-red, brown, and dusky-black. Sometimes also, medullary sarcom is accompanied with hydatids,[2] scrofula,[3] polyps,[4] osteosarcom,[5] &c., and seems to have an indistinct causal relation to these. True medullary sarcom does not appear to exist in animals, for under the terms *melanosis tuberculosa, tubercula nigra, charbon,* and *morilles,* of the French,[6] &c. especially in horses, the disease is as it were intermediate between tubercles and medullary fungus, whilst particularly upon the vent and about the generative organs, although also on other parts of the body, in the cellular tissue and in the skin, tumours arise which are roundish, gibbous, increase to the size of eggs, penetrate the neighbouring tissues, break also by ulceration, and consist of an external delicate, cellular envelope, and similar internal partitions, into which a fluid, mostly pap-like, but sometimes a clotted and firm mass is effused, which especially consists of fibrous matter, albumen, and black pigment. Sometimes these tumours approximate in character to the encysted, but never are they so malignant as medullary fungus.

(1) Also BLOODY FUNGUS, *fungus hæmatodes, f. medullaris,* MEDULLARY FUNGUS, SOFT CANCER, CARCINOMA, *spongoid inflammation, burns,* FISHSPAWN-LIKE TUMOUR, *Monro's,—Melanosis, Cancer melanoticus* of the French, *Encéphaloide* of *Laennec,* &c. There is no difference in the nature of medullary and bloody fungus, both frequently occur in the same tumour, and run imperceptibly into each other; a bloody fungus, if it be removed, returns again as a medullary fungus, and *vice versâ;* the so-named bloody fungus arises out of medullary fungus, from effusion of fibrous matter and blood into its cellular tissue.* The best writings on medullary sarcom are, *Burn's* Dissertations on Inflammations, Vol. II. p. 302, spongoid inflamm. — *Hey,* Practical observations on Surgery. Lond. 1803; fungus hæmatodes.—*Laennec* in Bulletin de l'école de Médec, 1800; in Dict. des Sc. médic. Art. Anat. pathol. Vol. II. and Art. Encéphaloides, Vol. XII. p. 165.—*Wardrop,* Observations on fungus hæmatodes, or soft cancer, &c. Edinb. 1809, with plates.—*Abernethy.*—*Maunoir* Mémoire sur les fongus medullaire, et hematode. 8vo. Paris et Genéve. — *Breschet* in Dict. des Sc. méd. Vol. XX. p. 126, Art. Fungus hæmatodes, and *ib.* Considérations sur une altération organique appellée dégénérescence noire, melanose, cancer, melané, etc. 4to. Paris, 1821, with a plate; also in *Magendie's* Journ. de Phys. expérimentale, Vol. I. No. 4. Oct. 1821. p. 354. — *von Walther* in his and *Graefe's* Journ. d. Chir. u. Augenh. Vol. V. Part II. p. 189.—*Langenbeck* in his N. Biblioth. f. d. Chir. u. Ophthalm. Vol. III. Part IV. No. 4. — *Schneider* D. de fungo hæmatode. 4to. Berol. 1821, with plates. — *Truckmüller* D. de fungo hæmatode et medullari. 8vo. Landish. 1821. — *Wagner* D. de fungo medullari. 8vo. Vratisl. 1823.—*Redlich* D. de fungo medullari. 8vo. Regiomont.—*Hasse* D. de fungo medullari. 4to. Berol. 1823, with lithographs.—*Calliot* D. Essai sur l'encéphaloide ou fongus medullaire. Strasb. — *Günther* Analecta ad anatomiam fungi medullaris. 8vo. Lips. 1824. — *v. Ammon* Beiträge zur Erkenntniss nd Behandlung des bis jetzt unheilbar gebliebenen FUNGUS HÆMATODES. 8vo.

Leipz. 1825, with six lithographs.—*Savenko* Tentamen pathol. anat. de Melanosi. 4to. Petropoli, 1825.—*Fawdington*, A case of Melanosis, with general observations on the Pathology of this interesting disease. 8vo. Lond. 1826, with two plates.—*J. Casper* D. de fungo medullari quædam. 8vo. Berol. 1826.—Of the many individual cases, only some more important are here mentioned. — *Bidloo* Op. omnia Dec. I. Exerc. 8. Dec. II. Exerc. I. Taf I. in the inguinal region.—Cases recorded by *Wardrop*, *Earle*, *Lawrence*, and *Langstaff*, in Med. chir. Transact. Vol. III. VIII. IX.—*Matussiere*, v. Giorn. della Soc. med. chir. di Parma, Vol. VI. p. 300, in Journ. de Médec. contin. Vol. XVI. p. 359, on the back.—*Fine* in *Sedillot* Journ. de Médec. Vol. XLV. p. 34 and 151.—*M'Kechnie* in Edinb. med. and surg. Journ. Vol. VII. p. 168, 1811.—*Brückmann* in *Horn's* Archiv f. med. Erfahr. July, 1811, p. 71, on the face.—*Rowen* in New England Journ. of Med. and Surg. No. IV. Oct. Boston, 1814, with plates, on the arm.—*Fanzago* in Mémorie sopra alcuni pezzi morbosi. Fasc. I. p. 65. Padov. 1820, pl. 4, on the leg. — *M'Clellan* in the American medic. Recorder, Vol. V. No. 4. Oct. New-York, 1822, on the neck.—*Wedemeyer* in *Rust's* Magazin f. d. ges. Heilk. Vol. XIII. Part 1. on the breast, the arm, and foot.—*Gerson* and *Julius* Magazin der ausl. Lit. d. ges. Heilk. Sept. and Oct. 1823, p. 197, on the wrist. —*Halliday* in Medical Intelligencer, No. 43 and 46, June and Sept. 1823.—*Rhades* in *Horn's* Archiv f. d. med. Erfahr. Nov. and Dec. 1823, p. 489, on the thigh.—*Allan*, System of pathol. and operat. Surgery, Vol. I. p. 264, note, on the hip; Archives générales de Médec, Vol. IV. Feb. 1824. —*Salomon* in Petersburg. vermischte Abhandl. a. d. Gebiete d. Heilkunde, Part III. Leipz. 1825.—*Velpeau* in Revue médic. franc. et étrang. Vol. I. p. 217 and 343, with plates, in the left armpit.—*Nicolai* in *Rust's* Magazin. Vol. XX. Part III. p. 540. *Otto* Verzeichniss der anat. Präparatensammlung. No. 2102—2106, p. 30. Breslau, 1826.—I have lately observed one case on the shoulder.—*Alibert*, in his Nosologie naturelle, Vol. I. p. 336, pl. B, gives a good engraving of medullary sarcom on the shoulder.—*Arnold* D. de fungo medullari. Vratisl. 1822.—*W. Cullen* and *R. Carswell* on Melanosis, in Edinb. med and surg. Journal, Jan. 1827.—*Meyen* Untersuchungen über die Natur parasit. Geschwülste im menschl. Körper, insbesond. über den Mark und Blutschwamm. Berl. 1828.—*Kastagne* D. de fungo medullari. 8vo. Kil. 1828.—*O. Zimmermann* D. de melanosi. 8vo. 1828, with plates.—*Fr. Kerksig* D. de fungo medullari. Halæ, 1828.

* [According to *Andral's* account of *bloody fungus*, or, as it has recently been named, " tissu érectile accidentel," this does not seem to be really the case; in true fungus hæmatodes the little vessels seem to vegetate, (ils semblent comme végéter,) and form tumours supported by cellular tissue; the vessels increase, and produce a structure very closely resembling that of the spleen, the blood is stayed in the little areolas thus produced, and in the veins, with which they freely communicate, and produces, by its variable quantity, rapid change in the consistence, colour and form of the tumour; and, if it burst, severe hæmorrhage occurs. But out of this vascular development there often arise lesions of nutrition and secretion; and hence we often find, commingled with this vascular base, fibrous, scirrhous, purulent, melanotic and other morbid productions; all of which are generally included under the term fungus hæmatodes. *Andral*, Vol. I. p. 176—179. T.]

(2) *Adams*, *Baron*, v. Hydatids.

(3) *Palletta* Exerc. pathol. etc.—*Panizza* Annotazioni anat. chir. sul fungo midollare dell' occhio. fol. Pavia, 1821. — *Wedemeyer.* — *Freudenberg* D. de tuberc. in hepate et pulm. causis atque cura. p. 16. Bonnæ, 1824,—*Proudfoot* in Edinb. med and surg. Journal, April, 1826.—*Otto* Selt. Beob. Part II. No. 56.

(4) *v. Walther*, and myself one case.

(5) *M'Clellan* and *Rhades.*

(6) The preparations which I saw in the veterinary cabinet at Alfort were marked *Morilles* and *Poireaux;* sometimes the black pigment is also wanting, (compare above, § 39,) and the tumours have then a whitish or flesh coloured appearance; this is the case, according to the verbal observation of *Godine*, especially in mules, and most commonly it occurs in white or grey horses, in rare cases in

roan, dun, and spotted horses; v. *Henon* in *Gohier*, p. 328; even in dark-coloured horses, v. *Flandrin* Instruct. et Observat. sur les maladies des animaux domestiques par *Chabert, Flandrin* et *Huzard*. Vol. IV. p. 298. Paris, 1822. Sometimes the disposition thereto seems to be hereditary.—v. *Brugnone.—Dietrichs* Gestüts-und Züchtungskunde. p. 580. Berlin, 1824. — Besides the horse, it has also been seen in the ass, the mule, dog, rabbit, cat, rat, mouse and white spoonbill; I have also found it in the stag; v. *Otto's* Verzeichniss der anat. Präparatensammlung zu Breslau, No. 2108; on these tumours, v. *Brugnone* von der Zucht der Pferde, Esel. u. s. w. a. d. Ital. von *Fechner*, p. 61. Prag. 1790.—*Viborg* Veterinair-Sellskabets Skrifter. D. II. III. p. 398, 484, under the title TUBERCULA NIGRA; *Gohier* in Compte rendu des travaux de l'école vétérinaire de Lyon. 1811, and Mém. et Observat. sur la chir. et la médic. vétérin. Vol. I. Lyon, 1813.—*Breschet.—W. Cullen* and *Rob. Carswell* in Transact. of the med. chir. Soc. of Edinb. 1824, Vol. I. No. 13. — *Noack* Comment. vet. med. de Melanosi cum in hominibus tum in equis obveniente, etc. 4to. Lips. et Paris, 1826, with three plates.

§ 68.

There now remains only to treat of the last and most malignant kind of spurious formations, CANCER, *scirrhus, carcinoma, or cancer*,[1] a disease which, distinguished at a general, often even at a first glance, and commonly originating in a strong hereditary disposition, occurs usually only in the middle and later stages of life.[2] It commences with scirrhus, a knob, or large tumour, which is separated from the neighbouring healthy parts;[3] usually single, and but rarely occurring in many parts at once, distinguished by its hardness, coldness, insensibility, whiteness, and weight, contains few or hardly any red blood-vessels, and presents, as a characteristic symptom, a great quantity of tendinous or cartilaginous fibres or plates, which pass either from the centre in a radiated form to the circumference, or decussate, and lie irregularly upon each other, and contain between them an inorganic jelly-like, albuminous, or half-coagulated fluid, mostly transparent and light coloured, but sometimes also turbid and yellow, or brownish, in greater or less quantity.[4] Such scirrhus, early or later, runs into an inflammatory state, in consequence of which it relaxes, softens mostly in the centre, becomes more hilly, infects the neighbouring tissue, and often attains a considerable size. It sometimes also contains several large bags full of lymph, has but few arteries, but at its commencement many large varicose veins, is commonly surrounded by much hard yellow fat, and presents in its interior, one or more ulcerated spots; in this state it is called HIDDEN CANCER, *cancer occultus*. The skin lying over the tumour is gradually connected with it, becomes wrinkled, knotty, discoloured, and even bluish-red, or lead-coloured, and ultimately breaks with effusion of much lymph. Now is the disease called OPEN CANCER, *cancer apertus*,[5] and becomes a malignant ulcer,

with a hard base and circumference, secretes a very foul and specific copious corroding ichor, has its surrounding edge jagged, destroys the neighbouring parts much more in circumference than in depth, and often produces a growing, easily bleeding fungus, secreting ichor.[6] Cancer occurs originally only in the external skin, in which case, instead of a true scirrhus, a malignant wart, a cartilaginous callosity, or a hard blackish varix precedes it; in the inner or mucous membrane, particularly in the mouth, throat, stomach, intestines, larynx, and mouth of the womb; next, particularly in the conglomerate, and lastly, very rarely in the lymphatic glands;[7] but it occurs secondarily in almost all organs.[8] True cancer is only curable in its first stage, by the total removal of the diseased structure, for the occasional production of a thin spreading skin upon the sore does not bound its malignancy, and the peculiar dryness and scarring of cancer, which is sometimes observed, is not less deadly;[9] however, a few cancerous tumours have been destroyed and cured by mortification.[10] Cancer never occurs in animals.[11]

(1) Compare *Reuss* Repertor. Comment. Art. Carcinoma, Vol. XII. p. 217—235; Scirrhus, Vol. XIV. p. 405; Tumor cancrosus, Vol. XV. p. 28; Tumor scirrhosus, Vol. XV. p. 43.—*de Plouquet* Repert Art. Carcinoma et Scirrhus.—*S. Cooper*, First lines of Surgery—*Cancer;* also *Hill*, Cases of Surgery, particularly of Cancer, &c. 8vo. Edinb. 1772.—*Hopkins* D. de Scirrho et Carcinomate. Edinb. 1777.—*Bierchén* introedes-tal om kaerftskaders, skrophuloese och veneriske Svers, etc. Stockh. 1778.—*Jaenisch* vom Krebs und dessen Heilart. 8vo. Leipz. 1784.—*Camper* Sämmtl. kleine Schriften deutch von *Herbell.* Vol. III. p. 156. Leipz.—*Abernethy.*—*Lacombe* Propositions sur le cancer. Paris, 1805.—*Ross* D. de carcinomate. Edinb. 1805.—*Home*, Observations on Cancer, connected with histories of the disease. 8vo. London, 1805.—*Gillichan* D. de carcinomate. Edinb. 1809.—*Akerman* resp. *Toppelius* D. in carcinoma observationes. 4to. Upsal, 1811.—*Skipton* D. de carcinomate. Edinb. 1814.—*Wentzel* Ueber die Induration und das Geschwür an indurirten Theilen. 8vo. Mainz, 1815.—*Baumann* Ueber den Krebs u. s. w. 8vo. Leipz. 1817.—*Westring* Erafhr. über die Heilung der Krebsgeschwüre. a. d. Schwed. mit Zus. von *K. Sprengel.* 8vo. Halæ, 1817.—*Young*, Minutes of cases of Cancer and of cancerous tendency, &c. Vol. II. 8vo. London, 1816—18.—*Rouzet* Recherches et observations sur le cancer. 8vo. Paris, 1818.—*Wolfers* D. de scirrho et carcinomate. 8vo. Gött. 1820.—*Scarpa* in Memorie dell' J. R. Istituto del' Regno Lombard. Vol. II. p. 123—153. Venet. 1821, and Sullo Scirro e sul Cancro Mémorie. 4to. Mailand, 1822. with a plate.—*Farre*, An Essay on Cancer. London, 1822.—*Wernecke* D. Nonnulla de cancro. 8vo. Berol. 1823.—*Roth* D. de Scirrho et carcinomate. 8vo. Berol. 1823.—v. *Walther* in his and *Graefe's* Journal d. Chir. and Augenh. Vol. V. Part II. p. 196.—*Rambach* D. de scirrho ejusque decursu. 8vo. Berol. 1824.—*van Wy* and *Schrage* in Handel. van het Genootsch. Servandis Civibus. D. IV. p. 1—207.—*Vorstmann* V. u. S. Verhandeling over den Kanker. 8vo. Utrecht. 1824.—*Graham*, Observations on Cancer, comprising numerous cases of cancer in the breast, hip, and face, &c. London, 1824.—*Velpeau* Exposition d'un cas remarquable de maladie cancereuse. 8vo. Paris, 1825.—*Costin* in Archives génér. de Médec. June, July, and Aug. 1826.—*Boedecker* D. de scirrho et carcinomate. Berol. 1826.—*Heusinger* Erster Bericht von der anthropotom Anstalt zu Würzburg. p. 27—33. 4to. 1826.—[*B. Peyrilhe*, Dissertation on Cancerous Diseases, trans-

lated from the Latin, with Notes. 8vo. London, 1777. — *Ledran* Mémoire de plusieurs observations sur le Cancer, in Mém. de l'Acad. Roy. de Chirur. Vol. VII. p. 223.—*M. Akenside*, Observations on Cancer, in Med. Trans. of Coll. of Phys. Vol. I. p. 45.—*C. T. Johnson*, Practical Essay on Cancer. 8vo. London, 1810.—*Howard*, Practical Observations on Cancer. 8vo. Lond. 1811. T.]

(2) *Wardrop*, p. 176, however, saw it in a boy of twelve years old, and *Home* in a man of fifteen years.

(3) A kind of cyst is said sometimes to be found surrounding it. I could never see it.

(4) According to the difference of organization of the parts affected with cancer, is the tumour of more or less loose texture, the jelly more abundant, fluid or thicker, and coloured, &c.; the appearance of the scirrhus also varies somewhat; hence arises the observation, not founded in fact, of scirrhus lardosus, hydatidosus, nodulosus, tuberculosus, &c. and the opinion of *Hunter*, *Adams*, and *Baron*, that cancer consists of broken-down hydatids. [According to *Andral's* view, cancer is not a distinct alteration, but only the ulceration, which, after a certain period, occurs in all lesions, either of nutrition or secretion. Vol. I. p. 501. T.]

(5) It is to be understood that the disease is also so called when it occurs in internal parts.

(6) *Himly* in his and *Hufeland's* Journ. der prakt. Heilk. 1809, Part XII. p. 126, once found in a closed cancer a perfectly formed fungus growth. I have twice found similar small ones.

(7) *Scarpa* denies this; however, *Klein*, chir. Bemerkungen, 8vo. Stuttg. 1801, p. 262; *Home*, p. 161; *Wardrop*, p. 175, note; and *von Walther*, have seen instances; I have also at this moment an opportunity of seeing such a case in an inguinal gland of an old woman of eighty.

(8) I am very doubtful, if malignant ulcers, badly treated swellings, &c., are actually converted into cancers; even NOLI ME TANGERE and CANCER SCROTI are only malignant ulcers, but not true cancer; in secondary cancer several parts are not unfrequently affected at once.

(9) *Pouteau* Œuvres posthumes. Vol. I. p. 164.—*Bayle* and *Cayol* in Dict. des Sc. médic. Vol. III. p. 555.—*Nicod* in Bulletin de la Faculté, etc. No. 1. 1810.

(10) *Bayle* and *Cayol.*—*Garneri* v. Bulletin des Sc. médic. par la Soc. médic. d'Emulation, Dec. 1810 and Sept. 1811.—*Richerand* Nosographie chirurgic. 2d edit. Part I. p. 387.—*Cruveilhier* Essai sur l'anat. pathol. Part I. p. 127.

(11) *Camper* Abhandlung von den Krankheiten, die sowohl den Menschen als Thieren eigen sind etc.; deutsch von *Herbell.* 2te Aufl. p. 48. § 7. 8vo. Lingen, 1794. To cancer of the sole in the horse, of the ear in dogs, scirrhus of the cow's udder, this name does not apply. v. *Greve* Erfahrungen und Beobachtungen über die Krankheiten der Hausthiere, in Vergleich mit den Krankheiten der Menschen, Part II. p. 65. 8vo. Oldenburg, 1821.

ELEVENTH SECTION.

Of Vices relating to Contents.

§ 69.

The last object of pathological anatomy is the consideration of VICIOUS CONTENTS, or the presence of EXTRANEOUS SUBSTANCES (*corpora peregrina*[1]) WHICH HAVE NO ORGANIC

CONNEXION WITH THE ANIMAL BODY. These may be introduced into the body from without, either accidentally or intentionally, or they may be here situated owing to a morbid activity of formation, and an irregular chemical action. Although they are not parts of the animal body, yet we must here treat of them, in so far as they are partly the consequence and the certain sign of a morbid condition existing during life; partly, and by no means seldom, as they produce very many diseases, as the highest irritation, inflammation, suppuration, tumours, plugging up of canals, mechanical injuries, and even complete destruction of individual parts. But these extraneous bodies are sometimes LIVING, as ANIMALS and PLANTS; sometimes DEAD, as STONES, EARTHS, SALTS, and the VARIOUS SUBSTANCES, partly NATURAL, partly ARTIFICIAL, which have entered into the body.

(1) *Reuss* Repertor. Comment. Art. Peregrinorum in corpus humanum Ingestio, Remora, Expulsio, Vol. XIV. p. 294—322.—*de Plouquet* Repertor. Art. Acus, Bufo, Dejectio, Lacerta, Peregrina, Vermes, Vomitus, etc.; and the several parts below.—*Schmidt* D. de corporum heterogeneorum in plantis animalibusque genesi. 4to. Berlin, 1825.

§ 70.

The ANIMALS,[1] which we very frequently find unnaturally situated in and upon animal bodies, are either such as get into them accidentally, but can remain and even support their existence there a long while, or such as, according to their nature, remain in the body for a certain period of their life, *hospites*, or always, *incolæ*, find in it their necessary protection and food, and are, therefore, called PARASITIC ANIMALS, *animalia parasitica et entozoa.* The following are the principal animals which we meet with in and upon the bodies of men and animals, according to the zoological scale:[2]

I. To the class of AMPHIBIA belong here TOADS, FROGS, and especially SALAMANDERS, which being accidentally swallowed, are discharged alive by vomiting, or going to stool.[3]

II. Of the MOLLUSCA we have SNAILS, *cochleæ*, and SLUGS, *limaces*,[4] which, if they have been swallowed fresh, are passed by the mouth and the vent.

III. Among the CRUSTACEA there are some which, as they have very soft coverings, live for protection or for other purposes even in the double-valved muscles, viz. in the *pinna*, and the sea muscle, *mytilus*, more rarely in the oyster, as it appears, without much inconveniencing the animals in which they are contained; this is particularly the case with the genus *pinnotheres*, *palæmon*[5] also, and the young *cancer mœnas*,

portunus puber, galathea strigosa, &c. The genus *phronima* prefers animals of the genera *beroe, pyrosoma,* and *medusa* for its habitation; and we find also little crustacea, particularly of the branchiopodous order, in the gills of fishes and mollusca.[6] Certain crustacea actually live like parasites on other animals, and nourish themselves from their juices; here, too, belong the WHALE LOUSE, *cyamus,* which is more commonly found in the skin of the cetacea, although met with also in some fishes; the SEA LOUSE, *cymothoa,* Fabr. which is found sometimes also under the skin[7] of many fishes and of some other sea animals; the genus *bopyrus,* the species of which are found at the lateral edges of the shell of the crab kind, *palæmon;* and, lastly, from the entomostracous order we have the *calygus,* which live on the soft spots in the skin, the palate,[8] and other parts of fish; the *argulus,* which is found in the stickleback, *gasterosteus,* and in the spawn of frogs; the *cecrops* and *dichelestium,* which are found on the gills of the tunny and the sturgeon; and, finally, the different kinds of *lernæa,*[9] which introduce themselves into the jaws, lips, fins, and other soft parts of many sea and fresh-water fishes.[9*]

IV. Of the class INSECTA,[10] there are also some found in the body, either as eggs, larvæ, or perfect insects, which remaining there for a shorter or a longer time, excite often a very considerable degree of inconvenience, and may be got rid of whilst alive. Thus we frequently see insects of very different kinds proceeding out of the ear, the nose, or more commonly from the mouth and vent. For instance, WATER PALMERS and WOODLICE, *asellus, armadillo, porcellio,* MILLIPEDES, *scolopendra, julus,* many CHAFERS, COCK-ROACHES, *blatta,* EARWIGS, *forficula,* CATERPILLARS, and especially the MAGOTS or larvæ of dipterous insects, viz. of CRANE-FLIES, *tipula,* and particularly of FLIES, *musca;* the latter occur very commonly in unadhering wounds and in foul ulcers of men and animals. Sometimes insects remain so long and in so great number that we might notice their propagation in the extraneous organism.[11] Certain insects instinctively and continually deposit their eggs in and upon the bodies of other animals, where their larvæ may find shelter and food. To these belong the GADFLY kind, *œstrus,* Lin., of which some, as the *œstrus humanus* of America, *œ. bovis,* also in deer, goats and camels, *œ. antilopæ, œ. tarandi,* and *œ. cuniculus,* in hares and rabbits in America, deposit their eggs beneath the skin by means of their ovipositor, where the larvæ called BOTS become developed, and produce large tumours, till they pierce and creep out of the

skin; but other kinds, as the *æ. ovis*, also found in goats, chamois and deer, and the *æ. trompe*, in rein deer, deposit their eggs in the nostrils, whence the larvæ make their way into the frontal sinuses; lastly, there are some, as the *æ. equi*, *æ. hæmorrhoidalis*, *æ. veterinus*, &c. which deposit their eggs on the skin and lips of horses, whence, by the animal licking itself, they are conveyed into the stomach, to which the larvæ attach themselves, till they pass out by the vent. Hereto also belong many insects which deposit their eggs in other perfect insects,[12] or in the larvæ of insects,[13] or in the eggs of insects,[14] in which the larvæ remain till their perfect development, and partially destroy the internal organs of the animals which they inhabit.

Finally, there are many insects which we call PARASITIC or ANIMAL INSECTS,[15] because they always or generally live upon and in other animals, on the juices of which they feed, and even bury themselves deeply in them. To these belong, first, of the ARACHNID ORDER, the MITES, *acarus*, *holetra* of Herm., and indeed the subgenera, *gamasus*,[16] *cheyletus*, *uropoda*,[17] *sarcoptes*,[18] the TICKS, *ixodes*,[19] *argus*,[20] *caris*,[21] *leptus*,[22] *achlysia*,[23] *atoma* or *trombidium* and *ocypete*;[24] then of the INSECTS, in a more confined sense, of the APTEROUS ORDER, *Aptera*, the *mallophaga*, CARNIVOROUS or PELLIVOROUS INSECTS of Nitzsch, *pediculi*, Linn., namely, the orders *philopterus*,[25] *trichodectes*,[26] *liotheum*,[27] and *gyropus*,[28] and the SUCKING ANIMAL INSECTS, as the LOUSE kind, *pediculus*,[29] and FLEA, *pulex*;[30] and then also the double-winged insects, *Diptera*, the genera *carnus*,[31] the FOREST FLY, *hippobosca*,[32] *nictyribia*,[33] and *braula*.[34]

V. Of the WORMS or ANNELIDA, here belong the LEECH kind, *hirudo*, certain species of which, now and then, are accidentally situated on and in the body, remain there for some time, and give rise to numerous affections;[35] but others, as the parasites, live upon turtle and fish,[36] the *gordius aquaticus*, which has been vomited up;[37] next the NEREIDS, *nereis*, which frequently perforate the shells of mollusca;[38] the *nemertes borlasii*, a sea-worm, which buries itself with its head in the anomia, and lastly, especially the INTESTINAL WORMS, *vermes intestinales*,[39] which live in the interior of men and almost all classes of animals, often increase there spontaneously in very great quantities, although they also often propagate in us, and are more or less hurtful. This order of worms comprehends the following kinds: the THREAD WORMS,[40] *filaria*, which are met with in the cellular membrane, the cavities of the body, and sometimes also in the intestines of men, beasts, birds,

amphibia, and fishes, and even of insects; *trichosoma* or *capillaria*, HAIRY-BODIED WORMS, especially in the alimentary canal of birds; *tricocephalus*, HAIRY-HEADED WORMS[41], in the larger intestines of men and beasts, and also of amphibia; *oxyuris*, a small kind in the intestinal canal of beasts;[42] *cucullanus*, HOODED WORMS, in the intestinal canal and belly of fishes, and perhaps also of some amphibia; *spiroptera*,[43] in the alimentary canal of man, and in many other parts of vertebral animals, sometimes forming knots of worms; *physaloptera*, in the alimentary canal of beasts, birds, and amphibia; *strongylus*,[44] in the intestinal canal, the kidneys, the air-tube, and many other parts in men, and animals of the first four classes; *ascaris*, ROUND WORM,[45] a very numerous kind which are found, especially in the alimentary canal, from man downwards to insects; *ophiostoma*,[46] in the alimentary canal of beasts and fishes; and lastly, *liorhynchus*,[46*] a little kind found in the alimentary canal of beasts and fishes.

VI. We find many of the class ZOOPHYTA living as parasitic in and upon other animals, and one particular order, *zoophyta parasitica*,[47] appear to be formed there. To these belong first, the family *acanthocephala*, with the peculiar but very numerous kind *echinorhynchus*,[48] which by means of their hook-like proboscis pierce into the alimentary canal of beasts, birds, amphibia, and fishes; then the family *trematoda*, which have openings or sucking points, by which they stick upon other animals, although they cannot perforate them;[49] these embrace the *monostoma* kind, which are found in the alimentary canal of a few beasts and amphibia, and of many birds and fishes; the *amphistoma*, in the alimentary canal of birds, but not so frequently in beasts and amphibia; *distoma*,[50] of which very many species are found, especially in birds and fishes, more rarely in beasts and amphibia, one even in crabs, in the most dissimilar parts, although especially in the alimentary canal and the biliary system; *pantastoma*, in the different organs of certain beasts and a few amphibia; *polystoma*,[51] in men, some amphibia, and on fish, in various parts; *tristoma*, Cuv. or *phylline*, Oken, on the gills and external skin of some fishes; *axine* of Abildgaard, on the gills of the garpike; *cyclocotyla mihi*,[52] on the skin of the garpike, and *phœnicurus varius*, or *vertumnus tethydicola*,[53] externally on the tethys; further, the family of the BANDSHAPED ZOOPHYTES, *cestoidea*, containing the genera *caryophyllæus*, of which the only species is found in the alimentary canal of many fishes; *scolex*, also but one species in the alimentary canal and belly of fishes and in the sepia dilopodia; *gymnorhynchus*, of which

a peculiar kind is found in the flesh of the brama raji;[54] *tetrarhynchus*, of which a few species are found in different parts of the sea turtles, fishes, and also of the cuttle fish, which they seem able to perforate; *ligula*, which kind are found in an imperfect state in the belly of many fishes, but in a more perfect state in the alimentary canal of animals living on fish, viz. in seals and sea-birds, and they are besides remarkable, as they perforate the living fish;[55] *tricænophorus*, of which the only species lives in the intestines of many fishes; *botricephalus*, TAPE WORM,[56] in the intestines of man, seals, birds, and fishes, and lastly, the *tænia*, CHAIN WORM,[57] a very common kind living in the intestines of men, beasts, birds, amphibia, and fishes. Finally, the family of CYST WORMS, *cystica*,[58] consisting of the genera *anthocephalus*,[59] which is found in some southern fishes; *cysticercus*,[60] peculiar to men and beasts; *cœnurus*, in the brain of sheep, antelopes, and cattle, affected with the gid, and *echinococcus*,[61] which occurs in men, monkeys, and some of the cloven-footed animals.

(1) v. *Baer* Beiträge zur Kenntniss der niedern Thiere in Nov. Act. N. Cur. Vol. XIII. Part II. p. 525. — *S. Mitchill* in *Francis* and *Beck's* New-York medic. and physical Journ.; and compare *Redi* Osservazioni intorno agli animali viventi che si trovano negli animali viventi. 4to. Firenze, 1684, with plates.—*P. S. Pallas* Diss. de infestis viventibus intra viventia. 4to. Lugd. Batav. 1760; recus. in *Eduard Sandifort* Thesauri Diss. Vol. I. p. 247. 4to. Roterod.. 1768.—*C. A. Rudolphi* Entozoorum s. Vermium intestinalium historia naturalis. Vol. II. 8vo. Amstel. 1808—10; also upon insects and other animals. — *de Olfers* De vegetativis et animatis corporibus in corporibus animatis reperiundis Commentarius. Pars I. 8vo. Berol. 1816.—*Virey* Mémoire sur les Insectes parasites de l'homme et de divers animaux, ou les entozoaires; in Journ compl. du Dict. des Sc. médic. Vol. XIV. p. 193.—[*M. Bloch* Traité de la Génération des Vers des Intestins, translated from the German. 8vo. Strasbourg, 1788.—*Boonaerts* De Vermibus crebrioribus intestinorum humanorum. Lovan. 1770.—*R. Hooper*, M. D., Observations on human intestinal Worms, being an attempt at their arrangement, with plates, in Mem. of Med. Soc. of London, Vol. V. p. 224. T.]

(2) I prefer this, because we do not know indeed, of the many parasites living on aquatic animals, whether they do not live sometimes by themselves, or whether the different species of the same kind, as leeches, support themselves in very different ways.

(3) Passing over the fabulous accounts of moles, cats, mice, chickens, and fish, which have been engendered in the bodies of men, and evacuated, there are however observations on amphibia which have been evacuated alive, not to be rejected as valueless, on account of the great tenacity of life in these animals; probably, however, a prudent scepticism with regard to them is very wholesome; but of the batrachial animals there have occurred some instances worthy of credit.—*Schenk*, in *Harless* Rhein. Jahrb. für Medic. u. Chir. Vol. VII. Part III. p. 138, gives a recent instance of a salamander; in the Bresl. Mus. No. 2542, is found a *bufo variabilis*, which, according to the evidence of a very circumspect and credible physician, was passed by stool.—*Spence*, in Edinb. med. and surg. Journ. Vol. IX. (a living salamander by stool.)—On one hundred live lizards, v. Beobacht u. Abhandl. von den östreich. Aerzten. Vol. I. p. 155. 1819. [*F. R. Zuingeri* Lacertus Aquaticus apuella quadam per alvum redditus, in Acta Helvet. Vol. I. p. 22. T.]

(4) A fresh instance in *Rust's* Magazin für die ges. Heilkunde, Vol. XIX. Part III. p. 509.—*Eyting* in *Hufeland's* Journ. d. prakt. Heilk. April, 1822, p. 16.

(5) For instance, *Palæmon pinnophylax* mihi. v. *Otto* Conspectus animalium quorundum maritimorum nondum editor. 4to. Pars I. p. 12. Vratisl. 1821. [*Pinnotheres veterum*, Mus. Roy. Coll. Surg. No. 293, in the shells of pinnæ and oysters; *P. pisum*, No. 294, J. B. in the shells of mytili and modioli. T.]

(6) I have seen these often also in sea fish; viz. once in *Blennius Phycis*, in the gills of which were attached a great number of animals of the *Praniza* kind. p. 13, under the word *Mesosoma*.—*Nicothoë astaci* in the gills of the lobster, and the female of the *Oniscus thoracicus* of Montague, under the shell of the Callianassa subterranea.

(7) To wit, *Cymothoa bopyroides*. v. *Lesueur* in Bulletin des Sc. par la Soc. philom. p. 45. 1814.

(8) To wit, *Caligus minimus* on the palate of the *Perca Labrax*. v. *Otto*, p. 14.

(9) Although some lernææ are very similar in form to worms, it however seems to me best to include them here, although this remarkable, little known race, may certainly be divided into many genera. [*Lernæa pectoralis*, Mus. Roy. Coll. Surg. No. 284, from the pectoral fins of a haddock; *Dichelestium sturionis*, No. 285, from the gills of the sturgeon; *Lernæopenna exoceti*, No. 285 A, from the back of the flying-fish; *L.* — No. 286, from fin of a diodon? *L.* — No. 286 A, from the cornea of the Greenland shark; *Lernæa*, No. 287, from the margin of the anus of a small squalus; *L. Spratti*, No. 287 A, and 287 B, from the sprat. T.]

(9*) [Here also may be added of the CIRRIPEDA the following:—*Cineras hunteri*, Mus. Roy. Coll. Surg. No. 265, on the tail of the hydrophis bicolor; *Tubicinella balænarum*, No. 279, Mus. Roy. Coll. Surg. in the skin of whales; *Coronula diadema*, No. 280—282 A, in same; *Balanus glacialis*, No. 282 B, on the spine of a dog fish; No. 282 C, on the arcturus tuberculatus; *Acasta*, No. 282 E, on a sponge. T.]

(10) *Heise* D. d. insectorum noxio effectu in corpus humanum. 4to. Halæ, 1757.—*A. Ascona* degl' insetti nocivi all'uomo, alle bestie, all'agricoltura, etc. Milano. 1824.—*Rudolphi*, Vol. I. p. 131, 161. and 513.—*Reuss* Repertor. Comment. Vol. I. p. 377, and Vol. XIV. p. 294, ff. and p. 318.—*de Plouquet* and *Virey*.—Several inapplicable, but one particularly apposite case, is related by *Yule*, in Edinb. Phil. Journ. No. 25, p. 72, July, 1825. I myself know some authentic cases of the *Meloe majalis*, caterpillars and fly maggots which were vomited; in reference to the latter, we must make strict inquiry; thus, I have seen fly maggots, said to have been vomited, produced from uncleanliness of the spitting-pot, and similar animals, said to be voided by stool, from the filthiness of a padded close-stool. [Observations sur des Chenilles expulsées vivantes de l'estomac et des intestines d'un homme, in Journ. de phys. Vol. IX. p. 230. T.]

(11) *Acrel* in Nov. Act. Soc. Upsaliensis. Vol. VI. p. 98.—*Osiander's* Denkwürdigkeiten, Vol. I. Part I. p. 1. Part II. p. 424.—*Pickel* in Transact. of the Association of Irish Physicians, 1824. Vol. IV. and V. No. 22 and 23; above 340 larvæ pupæ, and perfect animals of the *Blaps mortisaga*, passed by stool, and by vomiting above 700 similar animals, *Tenebrio molitor*, and thousands of the larvæ of flies. [Larvæ of the *Curculio* and *Scarabæus*, discharged by the urethra, frequently for the space of six weeks, *W. Henry*, Edinb. Med. and Surg. Journ. Vol. VII. p. 146. Similar larvæ were also in one case vomited, and in another passed by stool; case related by *T. Bateman*, v. Edinb. Med. and Surg. Journ Vol. VII. p. 41. I have before me specimens of the *Dermestes Murinus*, both in the larval and perfect state, which were passed per anum. Three hexapod larvæ, voided by stool, v. *Jessop* in Phil. Trans. Vol. X. p. 391, are considered by *Kirby* as belonging to the *Dermestes*, Fab. or *Byrrhus*, Lin. Probably also those mentioned by *Chichester* in a case of Hæmatemesis, in Edinb. Med. and Phys. Journ. Vol. VII. p. 326, belonged to this genus, perhaps are *D. Lardarius;* but his account is very unsatisfactory; he says that many hundreds were vomited and passed per anum. Mention is made in *Kirby and Spence's* Entomology, Vol. I. p. 140, of the larva of an insect probably belonging to the *Tipulidæ*, which was

passed by the urethra. In *Lempriere*, On the diseases of the Army in Jamaica, Vol. II. p. 182, is mentioned the case of a lady who died in consequence of the larvæ of some species of *Muscidæ* making their way from the cavity of the nose in which their eggs had been deposited, through the crybriform plate of the ethmoid bone into the brain. There is also a horrible case mentioned in *Kirby and Spence*, Vol. I. p. 138, in which a man, who was accustomed to place his superabundant food within his shirt, and next to his skin, having been taken ill and laid down in a field on a very hot day, the meat soon became putrid, flies were attracted to it, and deposited their eggs not only in it, but also in the body of the man himself, who, being found some little time after, was so eaten by the maggots that he died in a few hours.—*Elophilus Pendulus*, in the larval state, was found in the stomach of a woman. v. *Bonnet* Œuvres d'histoire naturelle et de philosophie, Vol. X. p. 144. 8vo. Neufchatel, 1779. T.]

(12) To wit, *Xenos* and *Stylops*, under the abdominal plate of wasps, and *Andrena*; *Cleptes coccorum*, Fabr. on the coccus kind, *Cryptus aphidum*, Fabr. on the vine fretters; *Conops rufipes* in the *Bombus lapidarius* and *terrestris*; *Conops ferruginea* in *Apis mellifica*.

(13) For instance, in the *Diploleparіæ*, Nees, or *Ciniptera*, Latr., in the larvæ of the gall fly; the genus *Foenus* in the larvæ of bees; all *Ichneumonides* in caterpillars and other larvæ; the *Musca larvarum* in caterpillars.

(14) Some species of the genus *Chalcis*, and some *Ichneumonides gemini*.

(15) *Redi* Esperienze intorno alla generazione degl' Insetti. 4to. Firenze, 1788. 5th edition, lat. Amstel. 1671, 1686, 1712. -- *de Géer* Mémoires pour servir à l'histoire des Insectes. 7 vols. 4to. Stockh. 1752—78.—*Hermann* Mémoire aptérologique. fol. Strasb. 1804.—*Nitzsch* Die Familien und Gattungen der Thierinsecten, INSECTA EPIZOICA, als Prodromus einer Naturgeschichte derselben, in *Germar* and *Zinken* Magazin der Entomologie. Vol. III. p. 261 ff.

(16) The *G. marginatus* in the diseased skin of men, even in the brain and eye-ball; also in swallow's nests; other kinds on mammalia and birds. Here, perhaps, the observations of *Bory de St.-Vincent*. v. Rapport des trav. de l'Acad. des Sc. pour l'an 1823, p. 42, with engravings. -- *Ib.* Sur un nouveau genre d'Acaridiens sorti du corps d'une femme, in Annal. des Sc. naturell. Vol. XV. p. 125. Oct. 1828. [*Gammasus gymnoptorum*, Mus. Roy. Coll. Surg. No. 370 B, in a humble-bee; *G. coleoptratorum*, No. 370 C, in a cetonia; *Cellularia bassani* in cellular tissue of gannet, *Montagu*, in Wern. Trans. Vol. I. p. 191. T.]

(17) Especially on chafers.

(18) Here *Sarcoptes*, or *Acarus siro*, or *Scabiei*, in the itch pustules of men; also in those of horses, dogs, cats, and on birds, &c. such animals occur.

(19) Especially *I. ricinus*, the dog-tick, and *reticulatus*, which live upon hair, but commonly bury themselves deeply in the skin of dogs, oxen, horses, and other quadrupeds. I found them also in the hare, even in the tortoise, and sometimes they multiply astonishingly; both occur also on men; also in Norway, *I. sanguisugus*, in America, *I. nigra*, in Egypt. *I. ægypticus*. [*Ixodes ricinus*, No. 373, Mus. Roy. Coll. Surg. in dogs and cattle; *I. splendens*, No. 373 A, from a tiger, and 373 B, from a tapir; 373 C, from the perineum and vulva of a rhinoceros; 374, from an iguana. T.]

(20) Upon pigeons.

(21) Upon bats.

(22) To wit, the *Leptus autumnalis*, which lives on grass, &c., and buries itself in the human skin, where it produces painful itching.

(23) Under the wings of the *Ditiscus marginalis*. v. *Andouin* in Bullet. des Sc. par la Soc. philom. 1822, p. 12. Drawings in Dict. classique d'histoire nat. Paris, 1822.

(24) The two latter kinds from insects.

(25) SUBGENERA are *Docophorus*, *Nirmus*, *Lipeurus* and *Gonioides*, all of which occur as parasitic in birds.

(26) On mammalia, viz. the dog, cat, sheep, goat, oxen, &c.

(27) The SUBGENERA are *Colpocephalum*, *Menopon*, *Trinoton*, *Eureum*, *Læmobothrion* and *Physostomum*, entirely in birds.

(28) Two species of these from *Cavia Cobaya*.

(29) In man, the following species occur: — *Pedic. capitis*, head-louse; *Ped. vestimenti*, clothes-louse; *Ped. tabescentium*, *Ped. nigritarum* and *Ped. pubis*, crab-louse;—cattle, swine, and deer have also their peculiar lice. In diseased men, lice are seen in the skin in pustules (even in the inner parts?);—often in astonishing quantity, and produce the so-called lousy disease, *Phthiriasis* v. *Plouquet* Repert. Art. Phthiriasis.—*Hufeland* Journ. d. prakt. Heilk. 1813. Part III. p. 122—127. — *Rust* in *Bremser* Ueber lebende Würmer in lebenden Menschen. p. 54, 55. 4to. Wien, 1819.—*Alt* Comm. de Phthiriasi. 4to. Bonnæ, 1824; with good drawings, and apposite observations.—*Sichel* D. Historiæ Phthiriasis internæ veræ fragmentum. Berol. 1825. — *Harder* in Petersb. vermischt. Abhandlungen a. d. Gebiete d. Heilk. Part II. p. 207. Petersb. 1823. — *Ib.* and *Müller* in the same. Part III. p. 254. Petersb. 1825, (in gouty persons).— According to Kirby, the supposed lice in pustules of the skin are *acari*, therefore he calls the disease *Acariasis*. [*Pediculi*, Mus. Roy. Coll. Surg. No. 375—381, from man, swine, turkey, dove, and crane. T.]

(30) For instance, the common flea, *Pulex irritans*, and the chigoe, *Pulex penetrans*, which, in America, buries itself deeply in the human skin, and produces very malignant and even fatal consequences; in beasts and birds other kinds, besides the common flea, occur.

(31) *Carnus hemapterus*, on starlings.

(32) The SUBGENERA are *Ornithomyia* on birds; *Normomyia*, especially on mammalia; *Lipoptena* upon stags and roes; *Melophila*, for instance, the sheep-tick, *M. ovina*.

(33) On bats.

(34) The *Br. cocca* on the honey-bee.

(35) Not unfrequently in the throats of men, in the nostrils of horses, and on the naked parts of the heads of water-birds.

(36) To wit, *H. branchiata*, *H. piscium*, and *H. muricata*, *H. sturionis*, *H. hippoglossi*, &c. in the gills of crabs. [*Lacretelle* in Gazette de Santé, Feb. 1828. Death by suffocation in a soldier who had swallowed a leech in drinking water; it was found in the right ventricle of the larynx. — *Vanderbach* in Journ. Univ. Hæmatemesis, for fifteen days after swallowing a leech in drinking water; the animal found its way into the pharynx, whence it was then pulled out alive by the patient. T.]

(37) *Deglaud* in Rec. d. trav. de la Soc. de Lille. 1820, p. 22. Lille, 1823. p. 166. v. *Leveillé* in d. Ann. de la Soc. Linn. Paris, May, 1825. p. 132.

(38) They appear to do this by a corroding juice, which dissolves the lime; in consequence, the mollusca fill up the hole with a peculiar yellow indissoluble animal substance.

(39) Under this head I understand the true intestinal worms, *i. e.* *Rudolphi's* Entozoa nematoidea, or *Cuvier's* Cavitaires, which, according to my opinion, are not to be separated from the Annelida. Concerning the intestinal worms in general, v. *Bloch* Abhandlung von der Erzeugung der Eingeweidewürmer und den Mitteln wider dieselben. 4to. Berlin, 1782, with ten plates.—*Goeze* Versuch einer Naturgeschichte der Eingeweidewürmer thierischer Körper. 4to. Leipz. 1782, with forty-four plates. Erster Nachtrag zur Naturgeschichte der Eingeweidewürmer von *Goeze*, mit Zus. u. Anmerk. von *Zeder*. 4to. Leipz. 1800, with six plates. — *Zeder* Anleitung zur Naturgeschichte der Eingeweidewürmer. 8vo. Bamberg, 1803, with four plates. — *Rudolphi* above, and Entozoorum Synopsis cui accedunt Mantissa duplex et Indices locupletissimi. 8vo. Berol. 1819, with three plates. — *Bremser* Ueber lebende Würmer in Lebenden Menschen u. s. w. 4to. Wien, 1819, with four plates. — *Ib.* Icones Helminthum systema *Rudolphii* entozoologicum illustrantes. fol. Fasc. I—III. Vienn. 1824.—*C. Fischer*, D. de entozois. 8vo. Viennæ, 1822.—*Gerardi de Vos* Disqu. med. de entozois humanis in Belgio repertis, &c. 8vo. Traj. ad Rhen. 1828.—*Creplin* Observationes de Entozois. P. I. 8vo. Gryphisw. 1825, with plates. —*Fr. S. Leukart* Versuch einer naturgemässen Eintheilung der Helminthen. 8vo. Heidelb. 1827, and Handb. der Helminthologie in naturhist u. medic. Hinsicht zu Vorlesungen. Heidelb. 1827, with plates. — *J. C. Zenker* Parasitæ corp. hum. internæ v. vermes intestinales hominis. Lips. 1827.—*C. B. C. Martius*

D. de vermibus in corpore humano. Würceb. 1828. — *Creplin* Novæ observationes de Entozois. Berol. 1829, with two plates.

(40) In men occur the skin-worm, guinea-worm, &c. *F. medinensis* in the tropical regions of Africa and Asia, especially on the feet, often occasioning much inconvenience, bore through the skin, and may then be drawn out. *J. Duncan*, D. de Filaria medinensi s. Gordio medinensi. Edinb. 1821.—*Kennedy* and *Smyttan*, v. *Gerson* and *Julius* Magazin d. ausl. Lit. d. ges. Heilk. 1825, Sept. and Oct. p. 242. It is doubtful whether it was the *Filaria bronchialis* or *Hamularia lymphatica*, which *Treutler* found in the neighbourhood of the bronchia of a man.—[*Filariæ*, No 167—173, in Mus. Roy. Coll. Surg.; among which *F. gracilis* in a cyst close to the trachea of simia satyrus, between pleura costalis and pulmonalis in sim. capucinus; *F. papillosa*, behind peritoneum and pleura, and in trabhea and globe of the eye in the horse; *F. macropi majoris*, a doubtful specimen, marked, 'Worms found alive within the capsular ligament of the knee-joint of the kangaroo;' *F. apis terrestris*, doubtful, in the abdomen of the humble-bee. — *Paton*, Cases of guinea-worm, with Obs. in Edinb. med. and surg. Journ. Vol. XI. p. 151.—*Filaria* in the belly of a spider. v. *Vicat*, in Lond. med. and surg. Journ. Vol. XXXIX. p. 478. T.]

(41) In man the *Trichocephalus dispar:* other kinds in cattle, sheep, dogs, and swine.—[*Trichocephali*, No. 173—174, in Mus. Roy. Coll. Surg.—*T. dispar* in cœcum of man, which was 'perforated as it were by a number of pinholes;' *T. depressiusculus?* in cœcum of dog and fox. T.]

(42) *Bremser* here includes also the *Oxyuris vermicularis* of men, according to *Rudolphi* an *Ascaris;* in the horse, *Ox. curvula.*

(43) It is doubtful whether the *Spiroptera hominis* is in the human bladder. [There is, however, a specimen of *S. hominis*, No. 174, Mus. Roy. Coll. Surg. on the bladder of a man; for *Lawrence's* account of which, v. Med. Chir. Trans. Vol. II. p. 382. T.]

(44) In men, the *Strongylus gigas* in the urinary organs; the same in many beasts; the *Str. armatus* is common in horses.—[*Strongyli*, No. 175—180ª, in Mus. Roy. Coll. Surg.—*S. armatus*, in aneurysms of mesenteric artery in horse and ass; *S. gigas*, two specimens in man, a third in the racoon, all from the kidneys, rarely in other parts; *S. filaria*, in bronchi of sheep; *S. inflexus*, in pulmonary artery of porpes; *S. minor*, from tympanum, eustachian tube and venous sinuses of the base of the brain; *S. criniformis*, from intestines of badger; *S. vulturis*, in a vulture. T.]

(45) In men, the *Ascaris lumbricoides* and *vermicularis;* the former occurs also in swine, cattle, horses and asses, and was found also in man, in a popliteal aneurysm, as well as in abscesses on the spine. v. *Otto* Selt. Beob. Part II. p. 41. No. 17.—*Velpeau* in Archiv. général. de Médec. Vol. VII. March. [*Ascarides*, No. 181—189, in Mus. Roy. Coll. Surg.—*A. lumbricoides*, from small intestines of man, and intestines of sus, bos, equus, and asinus; *A. marginata*, from small intestines of dog; *A. vermicalaris*, from large intestines of man; *A. spiculigera*, from œsophagus and proventriculus of cormorant; *A. testudinis terrestris*, from rectum of land tortoise; *A. pythonis*, doubtful species from stomach of a python; Case of ascarides, found in biliary ducts of a child, in Med. and Phys. Journ. Vol. XV. p. 28.—*W. Heberden*, Observations on ascarides, in Med. Trans. Coll. Phys. Vol. I. p. 45.—*A. lumbricoides?* from the cellular tissue of the belly. v. *M. Willius* in Act. Helvet. Vol. I. p. 73; from the cellular tissue of the arm, *D. C. E. Berdot* in *ib.* Vol. VII. p. 177. T.]

(46) A still doubtful kind which occurs in the stomach of men is the *Oph. Pouterii*, v. *H. Cloquet* in Nouv. Journ de Méd., Chir. et Pharm. Vol. XIII. Feb.

(46*) [*Liorhrynchi*, No. 189, in Mus. Roy. Coll. Surg. *L. gracilescens*, in the stomach of the great seal, in Mus. Roy. Coll. Surg. T.]

(47) That is, *Rudolphi's* last four orders of intestinal worms, *Cuvier's* Parenchymateux, and some parasites of this class living on animals; we may divide them into *Zoophyta entozoa* and *extozoa.*

(48) The largest and most common kind is the *Ech. gigas* from tame and wild swine.—*Westrumb* Comment. de Helminthibus acanthocephalis. fol. Hanov. 1821.

with three plates. — [*Echinorhynchi*, No. 190—194, Mus. Roy. Coll. Surg. — *E. porrigens*, from intestines of whalebone whale; *E. balanocephalus*, two specimens from the intestines of balæna rostratus; *E. filicollis*, two specimens from the intestines of eider duck. T.]

(49) For instance, the *Distoma ferox* bores itself pits in the intestine. v. *Goeze* p. 177. pl. 15, fig. 1.—[*Distomata*, No. 196—202, in Mus. Roy. Coll. Surg.—*D. hepaticum*, from the liver and gall-bladder of man and sheep; *D. variegatum*, from gall-bladder of wolf fish; *D. lineare*, three specimens from the windpipe of the eommon fowl and partridge. This animal is the cause of the disease called the 'gapes' in chicken. *D. hydrophidis*, doubtful, from the ovarium of the watersnake. T.]

(49*) [*Amphistomata*, No. 164[a]—195, Mus. Roy. Coll. Surg.—*A. conicum*, two specimens from the first stomach of the rein deer; *A. saletriquetrum*, from small intestines, cœcum and colon of beaver. T.]

(50) In man, in the gall-bladder, the *Distoma hepaticum;* the same in the liver and alimentary canal of many mammalia, viz. the horse, cow, sheep, goat and swine; most commonly in the sheep, the liver of which is thereby very frequently knotted. Some *Distomata* make the transition to the *Trematodoa extozoa*, as they are found in the gills of fishes, and externally on the skin. [*Fasciola trachea*, in chickens and young turkeys.—*Wiesentha* in Med. and phys. Journ. Vol. II. p. 204; also in young partridges and pheasants, *Montagu* in Werner. Trans. Vol. I. p. 194—198. T.]

(51) *Pol. pinguicola* was found by Treutler on a human ovary; the *Pol. venarum*, which he also found in a burst tibial vein, seems to me only a *Planaria;*—the *Pol. duplicatum* on the gills of the tunny, on account of its habitat, makes also the transition to the following kinds.

(52) *Otto* in Nov. Act. Acad. Nat. Cur. Vol. XI. Part II. p. 300, pl. 41, f. 2.

(53) *Rudolphi* Entozoorum Synopsis, p. 573.—*Otto*, p. 294. pl. 41, f. 1.

(54) I also found it in three instances of this fish in Nizza and Naples.

(55) *Goeze* engraves on plate 16, a *Ligula*, which had bored its way out of the spine of a fish. [*Ligula*, No. 203, Mus. Roy. Coll. Surg.—*L. cyprini*, from the abdominal cavity of a carp, perhaps C. Brama. T.]

(55*) [*Triænophorus*, No. 203[a], Mus. Roy. Coll. Surg.—*T. nodulosus*, from the stomach of the haddock. T.]

(56) In the intestinal canal of man occurs the *Bothryocpehalus latus*, otherwise called *Tænia lata*, in a remarkable manner, especially only in Switzerland and Russia—now and then in France; in Germany, Holland and England, but very rarely; hardly ever in the dead body. [*Bothryocephali*, No. 204—206[d], Mus. Roy. Coll. Surg.—*B. latus*, three specimens from intestines of a Swiss girl; *B. punctatus*, from stomach and intestines of a turbot; *B. macrocephalus*, from stomach of a greenland dove; *B. pythonis*, from intestines of a species of Python. T.]

(57) In man the *Tænia solium*, Lin., which however is also sometimes found not singly, but numerous, especially in Germany, Holland, England and the East; also, though rarely, occurs in spawn; it is then easily distinguished, as it attaches itself to the orifices of the ovaries on the edge of the organ, whilst the *Bothryocephalus latus* attaches itself to the surface. The head extremity is in both very thin and threadlike; the hinder joints of the *T. solium*, which are often shed singly, and which we formerly erroneously called flat worms; *Tæniæ* occur in all our domestic animals, except swine. [*Tæniæ*, No. 207—222, Mus. Roy. Coll. Surg.— *T. denticulata*, three specimens from the intestines of the genus Bos; *T. plicata*, from the small intestines of a horse; *T. perfoliata*, from the colon and cœcum of a horse; *T. anthocephala*, from the rectum of the great seal; *T. omphalides*, from the intestines of the short-tailed field mouse; *T. pusilla*, from the common mouse and rat; *T. solium*, four specimens from the small intestines of man; *T. marginata*, from the intestines of a wolf; *T. serrata*, three specimens from the small intestines of dogs; *T. crassicollis*, three specimens from the small intestines of a common cat.—*T. solida* of Gmelin, in cellular tissue of gasterosteus aculeatus, v. *F. L. Dick*, in Thomson's Annals of Philosophy, Vol. VII. p. 106. T.]

(58) Called also living hydatids; and it is well to distinguish them from the dead hydatids above described, § 64, to which they form the transition.

(59) *H. floriceps*, Cuvier's. [*Anthocephalus*, No. 222[a], Mus. Roy. Coll. Surg.—*A. macrourus*, from the genus sparus. T.]

(60) In man, in the brain, heart, but especially in the muscles, the *Cyst. cellulosa;* also in monkeys, and particularly common in swine; in most other domestic animals the *Cyst. tenuicollis;* in the horse *Cyst. fistularis.* [*Cysticerci*, No. 222[b]—227, Mus. Roy. Coll. Surg.—*C. fasiolaris*, two specimens from livers of mouse and rat; *C. tenuicollis*, three specimens from the pleura and peritoneum of ruminant animals and sow; *C. cellulosus*, two specimens in the heart of hog. *C. tenuicollis?* Mus. Roy. Coll. Surg. No. 593, from the urethra. v. *J. C. Letsom*, Mem. of Med. Soc. of Lond. Vol. II. p. 32; also *F. B. Finney, ib.* p. 516. T.]

60* [*Cœnuri*, No. 228—229, Mus. Roy. Coll. Surg.—*C. cerebralis*, two specimens from the brain of giddy sheep. T.]

(61) The species are the *Ech. hominis*, *Ech. simiæ*, and *Ech. veterinorum;* the latter in swine, sheep, oxen and camels. Upon the *Ech. hominis*, v. *Bremser* in *Meckel's* D. Archiv f. d. Physiol. Vol. VI. p. 292.

§ 71.

The existence of VEGETABLE SUBSTANCES, *producta phytoidea*, is much more rare and restricted in living animal bodies, than the animals already noticed; and here only belong the formation of MOULD, *byssus*, and of FUNGUSES, *fungus*, which rarely occur in foul wounds,[1] and on dirty, moist parts of the skin,[2] and such as are disposed to moisture from lying still, consisting of confervi, oscillatoria, tangæ, spongiæ, tremelli, &c., which are not unfrequently seen on the old or diseased skins of many animals living in sea or fresh water; for instance, of fish, particularly the carp, of the mollusca, the crustacea, and the water chafers, &c.

(1) It usually occurs in foul bandages, but sometimes also in the wound itself. I agree with *Jaeger*, Vol. II. p. 354, and with *Rudolphi*, in his Grundriss der Physiol. Vol. I. p. 292, 8vo. Berl. 1821, that we must entirely doubt the assertions as to the production of mould in living animals, respecting which, v. *Thayer* Verschimmelung, *Mucedo* in lebenden Thiere in *Meckel's* D. Archiv. f. Physiol. Vol. I. p. 310. — *Heusinger* De metamorphosi rostri pici et degeneratione mucosis in organismo animali vivente Progr. Jenæ, 1821.—On the growth of vegetables on living animal bodies, v. *Mitchill* in *Silliman's* Journ. Vol. XII. No. I. p. 21, March, 1827. — Neue Beobachtungen über Schimmelbildung am lebenden Körper. v. *Theile* in *Heusinger's* Zeitschrift. f. organ. Physik. Vol. I. Part III. p. 331.

(2) For example, after severe corrosive sweat mushrooms upon the vertebræ between the hairs. v. Memoire della Soc. med. di Bologna, Vol. I. p. 350. *Harless* in his and *Hufeland's* Journ. d. prakt. Heilk. Nov. 1815, p. 118.

§ 72.

The first and most important kind of DEAD EXTRANEOUS SUBSTANCES found in the animal body, are STONES, *calculi*,[1] so named from their hardness, composition, and inorganic form. But the STONE FORMATION, *lithiasis*, is the product of a morbid mixture of the animal fluids, and of a changed

dynamic influence of the solid parts containing it; hence in advanced age, and in the male sex,[2] in which *dyscraciæ* and the production of earth are frequent, it is more common than in young persons and in females; it is also very generally connected with other dyscracic diseases, viz. GOUT,[3] HÆMORRHOIDS,[4] so also in children with RICKETS and SCROFULA; CLIMATE and the MODE OF LIFE also appear to have great influence on the production of stone. Stones very frequently occur in animals, and are found in great quantity in beasts, birds, amphibia, and fishes, and even in invertebral animals;[5] in animals, however, they vary very considerably with respect to their frequency, inasmuch as they are very common in some kinds, whilst in others they are rarely seen at all.[6] As to the LOCALITY in which stones are formed, almost all parts of animal bodies seem disposed to this formation, although some parts are more especially so; thus we observe the stony deposit in the membranous system, in the organs of sense, and in the brain, in all cavities lined with serous membranes, very commonly in the alimentary canal and its adjuncts, as the salivary organs, the tonsils, the liver, &c., in the organs of respiration, circulation, and generation, but more especially in the urinary organs and the neighbouring parts, where the urine is in a morbid state. Not unfrequently are such stones produced in the body, voided by the natural openings, or by abscesses in very different parts. The number, size, colour, form and hardness of such stones vary without end, partly depending upon the localities in which they are formed; most of them are roundish and tolerably smooth, sometimes, however, they are also rough, angular, beset with points, so that they excite mechanical irritation; in other cases they stop up the canals of the body, or may be prejudicial in many other ways. They are also very different in structure; some consist of a close homogeneous mass, others are as it were chemical deposits, that is, incrustations of extraneous bodies which have remained some time in the organism, and are often hidden in them like kernels,[7] or frequently as concentric layers: in other instances they assume a more crystallized form, or consist of crystallized and uncrystallized layers alternately. Sometimes the earth and salts of which the stone is usually formed are not compounded into a stone, but are either collected in the body, as sand, dust or small crystals,[8] or are passed in large quantity with the urine, spittle, perspiration and ulceration,[9] &c.

(1) *Reuss* Repertor. Comment. Art. Calculus, Vol. XII. p. 156—216.—*de Plouquet* Repertor. Art. Calculus.— *Walther's* Anatom. Museum. Vol. I. 4to.

Berlin, 1796, with engrav. *Fourcroy* Sur le nombre, la nature et les caractères distinctifs des différens materiaux, qui forment les calculs, les bezoards et les diverses concretions des animaux, in the Annal. du Museum d'hist. natur. Vol. I. p. 93. 1802, with engrav.—*Marcet*, An Essay on the chemical history and medical treatment of calculous disorders. London, 1817.—*Bremmer* D. de calculis corporis humani propriis. Edinb. 1818.—*Brugnatelli* Lithologia umana, ossia ricerche chimiche e mediche sulle sostanze petrose, che si formano in diverse parti del corpo umano, etc. fol. Pavia, 1819, with engrav.—*Henry*, On urinary and other morbid concretions in Medic. chir. Transact. Lond. 1819. Vol. X. p. 410; and in *Thomson's* Annals of Philos. Febr. 1820. p. 10. — *Voelkel* D. de formatione concrementorum calculosorum corp. hum. 8vo. Vratislav. 1822.—[*Prout* on the nature and treatment of Gravel, Calculus, &c. 2d ed. 8vo. Lond. 1825.—*C. Scudamore*, on the nature and cure of Rheumatism. 8vo. Lond. 1827.—*A. Fourcroy* Observations sur les Calcules Urinaires de la vessie de l'homme, in the Mém. de la Soc. Med. de l'Emulation, Vol. II. p. 63. T.] Compare above, § 60, and different places. — On ANIMAL STONES, compare particularly *Vicq d'Azyr* Observations sur les concretions animales in Hist. et Mém de la Soc. Roy. de Médec. A. 1779. H. p. 204. A. 1780 et 1781. H. p. 279.—*de Lens* in *Sedillot* Rec. period. de la Soc. de Médec. de Paris, Vol. XLV. p. 3. — *Pelletier* fils et *Double* par Lens, *ib.* p. 129. — *Fourcroy.* — *Rudolphi* Uebersicht der bisher bei den Wirbelthieren gefundenen Steine, in the Abhandl. der Berl. Akademie. p. 171. Berlin, 1816.—*Suckow* Ueber die steinartigen Concremente der Wirbelthiere, mit bes. Rücksicht auf die Haus-und landwirthschaftlichen Thiere, in the Badischen Annalen für die ges. Heilk. Jahrg. I. Part II. p. 7. with engravings. [*Gaitskell*, On the intestinal calculi of horses, in Med. Facts and Obs. Vol. IV. p. 31. T.]

(2) *Steinmann* D. de causis, cur frequentius viri præ fœminis calculosi fiant. Argentor. 1750.

(3) Compare *de Plouquet* Repert. Athritis et Calculus. *Heim* D. de origine calculi in viis urinariis, quatenus est arthritidis effectus. Halæ, 1772.—*Murray* D. de cognatione inter arthritidem et calculum. Gött. 1767, in Opusc. med. Vol. I. Gött. 1785.—*Forbes*, Treatise upon gravel and upon gout, &c. 8vo. London, 1793. — *Wollaston*, On gouty and urinary concretions. 8vo. London, 1796.—*Moore*, On gouty concretions or chalk-stones. Med. chir. Trans. Vol. II. p. 112.—*Poth* Bestimmung der Gicht und ihr Verhältnis zum Rheumatismus und zu der Steinkrankheit. 8vo. Speier, 1825.

(4) *Alberti* D. de hæmorrhoidum consensu cum calculo et podagra. Halæ, 1720.

(5) To these especially belong the PEARLS of bivalve muscles, which are formed partly as a growth on the inner surface of the shell, especially after wounds, and also in the flesh of the animal itself; indeed they can be artificially produced by introducing small portions of the muscle shell. Oriental pearls are derived from the AVICULA MARGARITIFERA, especially from the Persian Gulf; the German from the MYA MARGARITIFERA; they may also be obtained from many other shells, viz. from the Haliotis tuberculata, Mytilus edulis, Anomia Ephippium, Spondylus Gædaropus, Arca Noæ, Anomia Cæpa, Pecten Jacobæus, Barbula plicata, etc. v. *Poli* Testacea utriusque Siciliæ. Vol. I. Introductio. Cap. IV. p. 18.—*Floerke* Repertorium, Vol. I. Part III. No. 20.—*Gray*, in Annals of Philosophy, Jan. 1825, p. 27.—*Ev. Home*, *ib.* June, 1826, p. 452.—Stones may be produced even in insects; thus I found a gallstone in a crab, and a stone in the stomach of the DYTISCUS MARGINATUS, in *Otto* Verzeichniss der anat. Präparatensammlung zu Breslau. No. 4126 and 4220.

(6) In vegetable more commonly than in animal feeders; very frequently in the horse; not very rare in the dog; in the cat, as far as I know, it has not been observed, &c.

(7) Such incrustations appear not merely in the intestinal canal and bladder, but also in the organ of hearing, in the nose, in the salivary ducts, in the air-tube, in the vagina, &c.

(8) I have twice found little crystalline bodies in tumours; for instance, *in* sarcoms.—*Howship's* Observations on the healthy and diseased formation of Bone, p. 176; found similar in morbid masses of fat, sea salt in wounds.—v. *Angeli* Sale

marino uscito della piaga di un piede, etc. 8vo. Imola, 1819.—v. Nuovi Commentar. Medicina, Juli, 2820.

(9) For instance, in one case, more bone than the weight of the whole body. [v. *Richter's* Spec. Therap. Vol. IV. p. 551. T.]

§ 73.

Lastly, we frequently find, both in men and animals, DEAD EXTRANEOUS SUBSTANCES, WHICH HAVE BEEN INTRODUCED ACCIDENTALLY OR PURPOSELY FROM WITHOUT, either through the natural openings of the body, as the ears, nose, mouth, fundament, and urethra, or by violence, viz. by gunshot, stabs, &c., into other parts of the body. These extraneous substances are of the most varied kinds, viz. bones, fish bones, muscle and crab shells, hair, kernels, nutshells, seeds,[1] bits of wood, thorns, straw, ears of corn, money, nails, rings, the points of daggers and swords, needles and bullets especially, pieces of tobacco pipe, case knives, forks, pieces of cloth, glass, and a thousand other things. It is remarkable that such bodies will remain for a considerable length of time, indeed even during the whole life, without producing any injury or inconvenience to the person; this is especially the case if a plastic bag has been formed around, so as to isolate them from the rest of the body.[2] Often are they after a long time coughed up or sneezed out, or if they be in the alimentary canal, are sometimes easily passed by vomiting or by stool. In other instances they produce very serious and even fatal consequences, as the perforation of important parts, inflammation and suppuration, stoppage of the alimentary canal;[2*] if in the air-tube, to suffocation or consumption; they give rise, as has been already observed, to stones, of which they form the kernels; bullets, small shot, pieces of cloth, &c., sticking in deep wounds, prevent union, and irritate the nerves;[3] bodies capable of swelling, as beans and peas, grow and violently distend narrow parts, as, for instance, the nostril and the auditory, passage, &c. Frequently, extraneous bodies travel very far in the body,[4] partly according to the laws of gravitation, partly according to the various motions of the parts, then appear at entirely different parts, often perforate, especially if they be pointed, many parts, and so sometimes get into those canals which open externally, or into the skin, and so become discharged; frequently, also, are they discharged by abscess,[5] and from bones by exfoliation: such wanderings we have most frequently seen in needles[6] and ears of corn.[7]

More than once quicksilver, which had been taken or rubbed in as an oxydule or an oxyd, has been observed to recompose itself in the body, and after remaining for a long time, to be

discharged as pure quicksilver,[8] through the skin,[9] or with the urine,[10] &c.

(1) They also penetrate the body through the skin; thus, the very pointed seeds of the STIPA PENNATA and CAPILLATA, which not only in Portugal, Greece, and Barbary, very much annoy the cattle, but in Hungary are fatal to the flocks of sheep. v. *Raspail* in the Annales des Sc. Naturelles, Sept. 1826. p. 82.

(2) I have found such many times; for instance, around a needle, around shots. Compare *Otto* Verzeichniss der anatom. Präparatensammlung zu Breslau, No. 2124 and 2125; the first is the sac described by *Benedict*, around six bits of metal and lead which had been shot in ten years previously. v. *Graefe's* and *Walther's* Journ. d. Chir. u. Augenh. Vol. V. Part I. p. 12.—[*G. Arnott*, a piece of iron which remained encysted in the arm for fourteen years, Med. Chir. Trans. Vol. XIII. p. 281. T.]

(2*) [A very remarkable instance of a man occasionally swallowing case-knives, which sometimes were vomited up, sometimes passed by stool, related by *A. Marcet*, in Med. Chir. Trans. Vol. XII. p. 52. Some of these, however, were retained for ten years, and the patient died of the consequent irritation. But it is very remarkable, that although the point of one of the knives retained had passed through the side of the rectum, there was no extravasation of fœculent matter into the cavity of the peritoneum. T].

(3) For instance, pain in the face from a piece of porcelain sticking in the integuments during fourteen years. *Jeffreys* v. *Froriep's* Notizen, 1823, No. 83, p. 271.

(4) Remarkable examples of such wanderings are to be seen in *Haller*, Element. Physiol. Vol. I. p. 15. — Schwed. Abhandl. übers. v. *Kaestner*, Vol. XXXIV. v. *Siebold's* Chiron. Vol. I. Part III. No. 9. p. 10.—*Doering's* Journ. f. d. neuste. Holländ. med. u. naturhist. Lit. Vol. I. Part IV. No. 2. [A needle found in the heart of a sheep, in Mém. de l'Acad. de Dijon, Vol. I. p. 107.—*Ledran* Observations sur des Epingles avallées et trouvés a diverses partres du corps sous la peau, in Mém. de l'Acad. Roy. de Chirurg. Vol. III. p. 91. T.]

(5) Many instances in *de Plouquet*, Art. Apostema;—two pieces of iron forks which were swallowed came out of the belly by ulceration. v. *Sonderland* in *Harless* N. Jarhb. d. deutsch. Medic. u. Chir. Vol. VII. Part III. p. 155, with engravings, Vol. X. Part III. p. 127. — A seton needle, which had been stuck into the uterus for the purpose of producing abortion, escaped from the belly by ulceration after seventy-nine days. — *Crouzit* in Archiv. général. de Médec. Sept. 1823.

(6) Compare *de Plouquet*, Art. Acus, besides *Westring* in Kgl. Svenska Vet. Akadem. Handlingar, 1810. Part II. (vomited.) — *Hall, ib.* (passed by stool.)—*Wagner* in *Rust's* Magazin. Vol. XVII. Part III. p. 556, (by vomiting, from the upper eyelid into the neck.)—*Bouzel* in *Hufeland's* Journ. d. prakt. Heilk. Nov. 1815, p. 112, (needles which had been swallowed came out at the feet.) — *Alibert* Nosologie naturelle, Part I. Gen. 2. Heterorexia (1500 needles, which had been swallowed at various times, passed through the skin in the urinary bladder and vagina.) — *Biermayer* Museum anat. pathol. No. 205, (a needle which had been swallowed, in the psoas muscle.)—*Lobstein* Compte rendu sur les travaux anatomiques, etc. 8vo. Strasburg, 1824, p. 42, (swallowed needles in many parts of the belly.—*Tourtual* in *Hufeland's* Journ. der prakt. Heilk. Feb. 1823, p. 110, (in the upper arm of a child.)—*Villars* in Mémoirs de la Soc. des Sc. de Strasbourg, 1823, Vol. II. p. 292, (300 needles and 50 pins, which had been swallowed, were removed by incision;—a second case was fatal.) — *Büchner* in *Henke's* Zeitschr. f. d. Staatsarzneikunde, 1823. Part IV. No. 14, (344 needles.) Diction. des Sc. médical. Vol. VII. p. 65.—*Duret* aus d. Journ. univers. des Sc. médical. in *Horn's* Archiv f. d. med. Erfahrung, Jan. and Feb. 1825, p. 173, (needles which had been stuck into the skin passed by stool).—*Herholdt* Observatio de affectibus morbosis Havniensis, cui plurimæ acus e variis corporis partibus excisæ et extractæ sunt. Havniæ, 1822. Although the needles, as *Herholdt* has subsequently ascertained, were

purposely introduced, the case is still interesting on account of the length of time they remained under the skin. I have myself seen, in the Friederich Hospital at Copenhagen, in another girl, needles which had been swallowed, cut out of the skin. — [*F. Bush*, a knife lodged in the back above thirty years, after which time it excited irritation, and was removed by excision, in Med. Chir. Trans. Vol. II. p. 102. T.]

(7) *Plouquet*, Art. Apostema. Spica.—*Reuss*, Vol. XIV. p. 321.—*Haller* Elem. Phys. Vol. I. p. 15. — *Mirandolle* van *Ghert* in v. *Siebold's* Chiron. Vol. I. Part III. No. X. (escaped after ten years from the chest).—*Bottomley* in London medic. chir. and Pharm. Repository, March, 1814, Vol. I.—*Marikowski* in *Hufeland's* Journ. d. prakt. Heilk. 1821. — *Bally* in Révue médicale franc. et étrang. Vol. II. April, 1825, (ears of grass which had been swallowed, were thrown out by the lungs and kidneys.) In the Lazaretto of St. Anna, at Brünn, I saw an ear of corn which had protruded in the lumbar region. In a person I knew, I saw several portions of barley-corns which had been swallowed, thrown out two years after from the neck.—[A pin, which had been swallowed by a woman, extracted fifteen months after, covered with oxalate of lime, from the urethra. v. *J. F. Jones*, in *Mitchill* and *Miller's* Med. Repos. Vol. V. p. 236. Now-York. T.]

(8) Particularly common on and in the bones, in the cavity of the skull, in the brain, in the cartilages of the larynx, about joints, &c. Compare *Fallopius* De morbo gallico, Cap. 76 and 78; *Fernelius* De luis vener. curat. Cap. 7, lin. 15; *Fourcroy* in Journ. d. Erfindungen. Part XL. p. 92; *Autenreith* Physiologie, Vol. I. p. 265; *Otto* Selt Beobacht. Part II. p. 36; and many old observations. v. *de Plouquet* Repert. Art. Mercurius.

(9) *Bartholinus* Hist. anat. Cent. I. Hist. 7. — Memoirs of the medic. Soc. of London, Vol. V. 1799.—*Brückmann* in *Horn's* Archiv f. d. medic. Erfahr. 1810. Vol. II. Part II. p. 252. — *Ekl* Bericht über die Ergebnisse im chir. Clinicum zu Landstrut. 1826.

(10) *Hochstetter* Observ. med. Dec. III. cas. 4.—*Rhodius* Cent. III. Obs. 37.—[*Dr. Mead* also states, that he found pure mercury in a vein. T.]

§ 75.

Just as variable is the CONSISTENCE of the cellular tissue. Sometimes we observe as a permanent individual condition, its unusual LAXITY or EXTENSIBILITY, or on the contrary its too great TENACITY and SOLIDITY; more frequently the MORBID CHANGE of consistence in the cellular tissue is, especially if it be very loose and moist, abnormally LAX and EXTENSILE, or if it be compressed, and have been deprived by various diseases of its semifluid state, and have been consolidated into fibres and leaves, it is found unnaturally SOLID and TOUGH.

§ 76.

Among the peculiar diseases of the cellular tissue, its very frequent INFLAMMATION, *inflammatio telæ cellulosæ*, or common *phlogosis*[1] with its consequences, deserves first to be mentioned; this especially attacks the cellular tissue beneath the skin, is often very wide-spreading, and easily runs into large abscesses and sinuses, or even into mortification.[2] The cellular tissue is very frequently SWOLLEN and HARDENED in consequence of the inflammatory effusion of albuminous and gelatinous fluids into it; to these belong many gouty, scrofulous, and other hard swellings, the thick foot, the often recurring, imperfectly cured erysipelas—the swelling in *pellagra*, in *elephantiasis*, the *mallenders* in horses, &c.; then the white swelling of the thigh, *phlegmasia alba dolens*,[3] a white, chronic, expanded, hot, very painful swelling of the thigh in lying-in women; indeed also in rare cases even in young women[4] and men,[5] and also attacking the arms;[6] and especially that peculiar INDURATION OF THE CELLULAR TISSUE, *induratio telæ cellulosæ, scleremia, scleroma*, &c.,[7] which particularly occurs in new-born children, and results from vices of circulation and respiration;[8] it is also observed in very rare cases, in later years, even in adults, and only on particular parts of the body.[9]

(1) Compare above, § 52.—*Neumann* D. de inflammatione telæ mucosæ. Berol. 1820.—*Pauli* in *Rust's* Magaz. f. d. ges. Heilk. 1828. Vol. XXVII. p. 127.—[*A. J. Testa* De cellulosæ telæ affectibus, in *Rœmer* Dissert. Med. Ital. 8vo. note.—*D. Craigie*, Elem. of gen. and pathol. Anat. p. 33. 8vo. Edinb. 1828. T.]

(2) Many cases of far-spreading diffused inflammation of the cellular tissue consequent on blood-letting, wounds in dissection, &c. are related by *A. Duncan*, jun. in the Trans. of the Med. chir. Soc. of Edinburgh, Vol. I. 1824, No. 21; and *Scott*, in the Edinb. Med. Surg. Journ. Vol. XXIV. p. 225. [Also *B. Travers*, on Constitutional irritation. 8vo. London, 1826, p. 223. T.]—Inflammation of the cellular tissue with sinuses from the foot to the trunk, v. *Bailey*, in Lond. Med. Repos. March, 1826.—Inflammation and suppuration of the cellular

tissue sometimes occur simultaneously in many parts of the body, which has been named NECROSIS TELÆ CELLULOSÆ; v. *Creutzwieser* in *Rust's* Magaz. f. d. ges. Heilk. Vol. XXII. Part II. p. 338.—*Otto* Selt. Beob. Part II. p. 41.

(3) *Zinn* in Comment. Soc. reg. scient. Götting. Vol. II. p. 364.—*White* on the swelling of the lower extremities in pregnant women. 8vo. Lond. 1803.—*Sankey* in Edinb. med. and surg. Journ. Vol. X. p. 401.—*Casper* Commentarius de Phlegmatia alba dolente. 8vo. Halæ, 1819.—*Velpeau* in Archiv. Gener. de Médec. Vol. VI. p. 221. *Pfeiffer* D. de. phl. a. d. quædam, adnexa hujus morbi historia. 8vo. Marburg. 1825.—*Struve* Comm. de Phl. a. d. quindecim observationes practicas continens. 8vo. Tübing. 1825.—*Reuter* D. de Phl. a. d. 8vo. Berol. 1826.—*Sellheim* D. de Phlegmasia dolente. 8vo. Dorpat. 1826.—*de Hübschmann* D. de Phlegmasia serosa. 8vo. Mitav. 1825. — *James Mann* in Medical Communications of the Massachusetts medical Society, Vol. II. p. 1. Boston, 1813.—*Freyberg* D. s. Annotationes quasdam in phlegmatiam albam sic dictam dolentem. 8vo. Halæ, 1820.—*Grimm* D. quædam de phlegmasiæ albæ dolentis pathologia. 8vo. Berol. 1826.—*Goldmann*, v. *Ammon* and *Feist* in der gemeinsamen deutschen Zeitschrift für Geburtskunde, Vol. II. Part II.—*Böhr* v. *Siebold's* Journal für Geburtshülfe, Vol. VII. Part. II. p. 420.—*Hugh Fraser* and *Lizars* in Edinb. med. and surg. Journ. January, 1827.—*O. Fr. Schumann* D. s. Phlegmatiæ albæ puerperarum dolentis observationem, adjectis nonnullis animadversionibus in ejusdem naturam. 4to. Jenæ, 1828.—*Fricke* Annalen der chirurg. Abtheilung des allgem. Krankenhauses zu Hamburg, 1826, Vol. I. p. 88. This disease is sometimes the consequence of stoppage or adhesion of the veins.—[*Robert Lee*, M.D. Two very excellent papers on Phlegm. Dolens, showing it to originate in inflammation of the iliac and femoral veins, in Med. Chir. Trans. Vol. XV. p. 132 and 369.—*W. Lawrence*, Case of Phlegm. Dolens from inflammation of veins in the lower extremity, *ib.* Vol. XVI. p. 58. T.]

(4) *Hazeltine* in med. papers communicated to the Mussachusetts Med. Soc. Vol. III. p. 1. Boston, 1819.

(5) *Davies* in Lond. Medical Repository and Review, July 1825.—*Francis* in New-York Medical and Physical Journ. No. 1.—*Struve.*—[Case of Phlegm. Dol. in a phthisical boy, is given by *T. H. Holberton*, in Med. Chir. Trans. Vol. XVI. p. 63. T.]

(6) *Francis.*

(7) *Reuss* Repertor. Comment. and *de Plouquet* Repertor. Art. Tela cellulosa.—*Carus* Ueber die Zellgewebsverhärtung neugeborner Kinder in *Hufeland's* Journ. Vol. XLII. Part II. p. 110.—*Schönberg* D. de indurationе telæ cellulosæ in neonatis. Gött. 1808.—*Wiesner* D. de tela cellulari infantum indurata. 8vo. Berol. 1816.—*G. Jaeger* in *Harless* Rhein. Jahrb. für Medic. u. Chir. Vol. III. Part II. p. 42, and *Harless* in same, p. 85. — *Alibert* Nosologie naturelle. Vol. I. p. 494.—*Liberali* in Nuovi Commentarj di Medicina e di Chirugia, 1818, p. 337.—*Breschet* in Bulletin de la Soc. d'Emulat. de Paris. Avril, 1822.—*Carminati* and *Palletta* in *Omodei's* Annali universali di Medicina. Vol. XXVIII.—*Leger.* Considérations sur l'endurcissement du tissu cellulaire chez les nouveau-nés. 4to. Paris, 1823.—*Sudoffsky* D. de telæ cellulosæ indurationе. 8vo. Dorpati L. 1824.—*Bærmann* D. de tel. cell. ind. Berol. 1823, in a boy of six years.—*Michaelis* De ind. telæ cellul. recens nator. Commentatio. 8vo. Kiliæ, 1825.—*Denis* Recherches d'Anatomie et de Physiologie pathologiques sur plusieurs Maladies des Enfans nouveau-nés, p. 145. 8vo. Paris, 1826.—*Palletta* in *Omodie's* Annali, etc. Vol. XXXV. Luglio—Settem. 1825.—*Billard* in Archiv. générales de Médec. Vol. XIII. p. 204. Feb. 1827.—*Baumgarten* D. de indurationе textus cellulosi neonatorum. 8vo. Halæ, 1821.—*P. Fleischhammer* D. de scleremate. 8vo. Berol. 1828.—[*Andral* Précis d'Anat pathol. Vol. I. p. 201. T.]

(8) According to *Denis*, it arises in connexion with inflammation of the stomach and intestines.—[*D. Craigie*, p. 45.—*Andral*, Vol. II. Part II. p. 577. T.]

(9) Especially in the cheeks, in the pubic region, and on the extremities; in children, particularly such as are fat, there is observed at the time of teething, and continuing for many months, a hard swelling in the cheeks. A similar

hardening of the cellular tissue, connected with too great production of fat, has already been observed as a rare disease in one fœtus. v. *Otto*, Selt. Beob. Part II. p. 166. tab. 4. f. 3.

§ 77.

We frequently observe irregularities in respect to the CONTENTS of the cellular tissue, inasmuch as, not only are the fluids usually found, viz. the FAT and the SERUM, irregular, but entirely EXTRANEOUS SUBSTANCES are also contained in it. As to the FAT, it is not merely found in very small quantity in great meagreness, and in too great quantity in morbid fatness, *adiposis*, in every part, or only in certain parts in the cellular tissue,[1] but it also often deviates in COLOUR, COMPOSITION, and CONSISTENCE: thus it may be too pale, or too dark, reddish, merely discoloured, and not unfrequently in cachetic persons, too soft, jelly-like and smeary; but in other cases, on the contrary, it is found too hard, horny, and even like wax. Similar vices are also observed in the serum of the cellular tissue, which may be entirely deficient, in great general, or local meagreness and dryness of the body; but it is more frequently in too great quantity in the cellular tissue, *anasarca*, *leucophlegmasia*,[2] or in particular places, *œdema*,[3] for instance, especially in the eyelids, the scrotum, the pudenda of women, the hands and feet. Often is the serum DISCOLOURED; thus, it is yellowish in jaundice, in yellow fever,[4] in typhus, in diseases of cattle, viz. in mortification of the spleen, &c.; turbid and milky in the so-called milk change, and if it be mingled with pus; reddish with blood, &c. The serum frequently varies in reference to its consistence; thus, on account of the decay of animal substance, it is too watery, as in dropsy; or by the unnatural mixture of albumen and fibrous matter, it even becomes as thick as jelly. To the very extraneous productions in the cellular tissue belong those of AIR AND OF ANIMAL GASES, by which AIRY AND WINDY TUMOURS, *pneumatosis*, *emphysema*,[5] are produced, which most commonly originate in the escape of air from the respiratory organs into the cellular tissue on the neck and breast, consequent on penetrating wounds of the lungs, broken ribs, contusions, violent strains, as in delivery, violent coughing, &c., and these often extend very far, indeed almost over the whole of the body.[5*] We, however, also observe these airy swellings in the cellular tissue in other parts of the body, viz. after convulsions and fevers, under the skin of the head, of the joints, and among the muscles—in the arm-pit after the reduction of dislocated arms; without suspicion of any putrefaction between the membranes of the alimentary canal, the gall-bladder, &c.[6] EFFUSIONS OF

BLOOD INTO THE CELLULAR TISSUE, *sugillatio, effusio, ecchymosis,*[7] are very frequently found. If internal abscesses burst, the PUS escapes into the neighbouring cellular tissue, and by apertures in the urinary passages, the URINE also, which often extends very far in the cellular tissue of the back, in the pelvis, and beneath the muscles of the belly, even up to the breast. We also find various kinds of gases and fluids in the cellular tissue in consequence of the great penetrability of animal membranes. Further, PARASITIC ANIMALS, viz. *acari* or *mites,* larvæ of the *œstrus, filariæ,* and *cysticerci,*[8] are found in every part of the cellular membrane of man and animals; next, not unfrequently BONY and STONY CONCRETIONS; and lastly, many DEAD EXTRANEOUS SUBSTANCES, which are conveyed from without into the organism, remain in the cellular tissue often for a long time without any apparent injury, and often, even travel about to a very great extent.

(1) Compare above, § 18, in which, however, it is also to be observed that organic diseases of the brain and heart rarely induce consequent wasting; further, § 20 and § 21. *Grüne* D. de sana et morbosa pinguedinis in corpore secretione. 8vo. Berol. 1826. *Alibert,* in his Nosologie Naturelle, Vol. I. p. 490, pl. A, gives an engraving of a very fat boy of twelve years old. An instance of the cure of a case of very large adiposis is given by *v. Graefe* in Journ. für Chir. und Augenheilk, Vol. IX. Part III. p. 367, with an engraving. [Dr. Cheyne also, who, when thirty-five years of age, weighed 448 pounds, by proper management, reduced his weight to 280 pounds, and lived to the age of seventy-three. *A. P. Cooper's* Lectures, MSS. T.] Compare also the articles *Obesité, Corpulence* and *Graisse* in the Dict. des Sciences Médic.—*G. M'Crake* D. de pingue et pinguitudine. Edinb. 1805. [There is in the Mus. St. Thomas's Hosp. a piece of fat from the abdomen of a woman, which is about four inches thick. T.]

(2) *Breschet* Recherches sur les hydropisies actives en général, et sur l'hydropisie active du tissu cellulaire en particulier. Diss. inaug. 4to. Paris, 1812. Compare above, § 51 and § 55. In brutes ANASARCA is less frequent than in man, although often to be observed in monkeys, sheep, calves, dogs, and in poultry; the opposite state of the fat and serum is also very interesting, as when the one is unnaturally increased, the other appears to be decreased.

(3) In nervous and gastric diseases, particularly in hypochondriac and hysterical persons, there sometimes occur suddenly tumours of very different size, which, after a few hours or days, or at death, immediately subside, and are produced by effusion of SERUM. ŒDEMA not unfrequently occurs as the consequence of the obstructed reflux of blood, owing to compression or adhesion of the veins.

(4) De l'état anatomique de la peau et du tissu cellulaire dans la fièvre jaune, &c. by *Desmoulins,* in *Magendie's* Journ. de Physiol. expérim. Vol. III. No. 3, p. 255.

(5) *J. P. Frank* de curand. hom. morb. Epitom. lib. VI. de Retentionibus.—*Waitz* D. de emphysemate. 4to. Lips. 1803.—*Hebenstreit* D. de emphysemate. Lips. 1803.—*Halliday* de Pneumatosi D. Edinb. 1806, and Observations on Emphysema in Edinb. med. and surg. Journ. Vol. IV. p. 351.—*Verdeyen* Essai sur l'Emphysème, etc. Paris, 1809.—*Cheyne* D. de Emphysemate. Edinb. 1820. v. also *Vidal* Essai sur le gaz animal considéré dans les maladies, etc. Marseille, 1809. v. *Sedillot* Journ. Vol. XXXV. p. 422.—Also in animals, especially in birds, emphysema occurs, [of which No. 599, Mus. Roy. Coll. Surg. is an example. T.]

(5*) [I once saw a case of emphysema of the face, in consequence of fracture of the outer table of the frontal sinuses and the escape of air from the nose. T.]
(6) Compare above, § 51.
(7) v. § 37.
(8) Compare above, § 70.

THIRTEENTH SECTION.

Of Cellular Membranes.

§ 78.

The animal membranes which either entirely or for the most part are composed of cellular tissue, are, in reference to their vices and diseases, so closely connected with the cellular tissue, that what has been already said in the preceding section generally applies to them. We, therefore, here merely premise that these membranes can AS LITTLE BE ENTIRELY WANTING AS THE CELLULAR TISSUE IN GENERAL, since the circumscription of the external extent of the organism, as well as the internal organic separations, necessarily depend upon them, and that they CAN BY NO MEANS ALWAYS EXHIBIT THOSE REMARKABLE VARIETIES which they show in a higher development of the organism. They still, indeed, sometimes retain for a longer period, that is, as a retarded formation, that indeterminate character which they possess in the early stage of fœtal existence; or they appear often, even in adults, in spurious formations, especially in encysted tumours, not less indistinct, so that it is difficult to distinguish whether it be a serous, a mucous, or a skinny membrane. The cellular membranes also, when subsequently diseased, become so changed, that they are mutually converted into each other; so that for instance the external skin, in violent and continued extension, by which the vessels, nerves and glands in it disappear, assumes the appearance of a serous membrane; in other cases, by loosening, expansion and exclusion from the air, it resembles a mucous membrane,[1] and on the contrary a mucous membrane unnaturally subjected to the influence of air, assumes not unfrequently the nature of skin,[2] as is the case in protrusion of the rectum and of the vagina.

As the cellular membranes stand in close formal connexion with the systems and organs to which they as essential parts belong, so it will be in part better to treat of them together;

and we shall, therefore, at present, only consider the more common of them, namely, the serous and mucous membranes, and the external skin.

(1) *Hebréard* Mémoire sur l'analogie qui existe entre les systèmes muqueux et dermoide in Mém. de la Soc. médic. d'Emulat. Vol. VIII. Part I. [*Andral* Précis d'Anat. Path. Vol. I. p. 263. T.]

(2) In monsters with extensive congenital clefts, of which the cavities are lined with mucous and serous membranes, I have several times seen these membranes too thick and firm, and very nearly approximating to leather in appearance.

FIRST CHAPTER.

Of Serous Membranes.[1]

§ 79.

Entire DEFICIENCY of the serous membranes can only occur in such imperfect monsters as have neither the larger cavities of the body nor even the cavities of the joints formed, with both of which these membranes necessarily and simultaneously exist. More commonly they are absent only at certain parts, viz. the pleura, the pericardium, a portion of the mesentery, some of the mucous bags, &c.; they also sometimes at a later period degenerate by resolution into cellular tissue, viz. in unreduced dislocations, in anchylosis after smashing of the mucous bags, &c. Sometimes, also, we observe in them EXCESS OF FORMATION, inasmuch as irregular processes and sacs of serous membrane are occasionally found congenital, whilst at every period of life serous membranes can be produced, and always are produced, when there is formed in the body a permanent and perfectly closed cavity, as for instance, in new joints and encysted tumours.

(1) To which also, on account of the similarity of their texture, the synovial membranes and mucous bags belong. On the diseases of the latter compare *Koch* D. de morbis bursarum tendinum mucosarum, 4to. Lips. 1790; and Untersuchung des natürl. Baues und der Krankheiten der Schleimbeutel, 8vo. Nürnb. 1795.—*Herwig* D. de morbis bursarum mucosarum. 4to. Gött. 1795.

§ 80.

The SIZE and FORM of serous membranes, as they merely line the interior of cavities, depend entirely on them, and are therefore subject to many deviations; wherefore we

must only remember that they possess a CONSIDERABLE EXTENSIBILITY, and often become expanded, together with the other parts of the walls of the cavities, into large sacs. Also, in reference to CONNEXION, they sometimes present irregularities, as, in the non-existent separation of the several cavities of the body, the usually distinct serous membranes run into each other.[1] BREACH OF CONTINUITY does not often occur in them, on account of their great pliancy; to this, however, belong dislocations with rupture of the articular capsule, and the rupture of the serous membranes alone, especially of a hernial sac, is sometimes observed consequent on external injury or very violent extension. Irregularities as to COLOUR are not very rare, as, for instance, in dropsy they become dim, cloudy, and too white; in other instances, on account of the excessive filling of the vascular tissue lying beneath, they are as it were injected, spotted, even more or less red; in high degrees of jaundice they appear yellow; in mortification and melanosis, blackish, &c.; in rare instances also we have observed petechial spots upon them.

(1) To wit, the pericardium may run into the pleura; these into the peritoneum; this larger bag, in consequence of the imperfect closing of the abdominal ring, into the external process of the peritoneum (tunica vaginalis testis); mucous bags as congenital vices, or as consequent on friction, into the neighbouring articular cavities, &c.

§ 81.

Among the vices of texture of serous membranes must be mentioned, before all other, their INFLAMMATION,[1] which is very frequently idiopathic, in consequence of mechanical and other causes, particularly when they are brought in contact with atmospheric air; not unfrequently is it also sympathetic and metastatic in eruptive diseases, in gout, puerperal fever; sometimes has an acute, sometimes a chronic course, and creeping along as it were by degrees, can extend itself very widely. This inflammation rarely runs into true SUPPURATION[2] and MORTIFICATION,[3] but is especially disposed to the EXUDATION of serum and fibrous substance, from the latter of which are very frequently produced on the open surface of serous membranes, PLASTIC CONCREMENTS, which assume the form of fibres, bands, cells, and false membranes, and very commonly effect close or loose ADHESIONS of the outer and inner surfaces of serous membranes. We often find the serous membranes THICKENED in consequence of the inflammatory state, and indeed either LOOSENED and ŒDEMATOUS, or more frequently HARDENED, and not rarely CARTILAGINOUS and BONY in certain spots. A more common morbid state of

the serous membranes in man and animals is the deposition of SCROFULOUS MATTER in them, and the formation of the so-called TUBERCLES;[4] more rare are EXANTHEMATOUS PUSTULES and KNOTS, TUMOURS ATTACHED BY THIN NECKS, ENCYSTED FORMATIONS, FUNGOUS and SARCOMATOUS EXCRESCENCES.[5] HYDATIDS, on the contrary, are often found on the serous membranes of man and animals, either singly or in large cysts.

(1) *Latralle* D. sur l'inflammation du système séreux. Paris, 1802.—*Sauceur* D. sur les inflammations des systèmes séreux et du système synovial. Paris, 1812.—As serous membranes possess no blood-vessels, the seat of inflammation is, in the strictest sense, rather in the adjacent layer of cellular tissue, and on the surface of the organs covered with serous membrane, than in the serous membrane itself. These, however, participate in the disease.—*Moffait* D. sur les Phlegmasies des membranes synoviales des articulations. Paris, 1810.—*Flormann* resp. *Lorich* D. de signis inflammationis membranarum serosarum. 4to. Lund. 1812.—*Chomel* D. sur le Rheumatisme. Paris, 1813.—*Villerand de la Fosse* D. sur Rheumatisme. Paris, 1815.—*Roche* Phlegmasies du système fibro-sereux des articulations. 4to. Paris, 1819.—[*Andral*, Vol. I. p. 281. T.]

(2) The disposition to malignant ulceration in mucous bags which are opened and exposed to atmospheric air is very remarkable, it can even give rise to fungous growths.

(3) This never occurs singly and primarily in the serous membranes, but only secondarily, and simultaneously in the neighbouring organs.

(4) An Inquiry, illustrating the nature of tuberculated accretions of serous membranes and the origin of tubercles and tumours in different textures of the body, by *John Baron*. 8vo. London, 1819, with plates.

(5) *Zink* Reflexions et observations sur les fongus des membranes séreuses, in Journ. compl. du Dict. des Sc. Méd. Vol. XXI. p. 24.

§ 82.

The CONTENTS of the cavities formed by serous membranes also vary considerably from the rule; we observe, indeed, sometimes AIR, as consequent on an exhalation which has occurred during life—next, PUS and BLOOD,[1] collected in them, and very frequently WATER, of which the quantity, colour, consistence, and composition varies remarkably,[2] and produces large swellings of the head, chest, belly, scrotum, the capsules of joints, and the so-called *ganglia*.[3] The latter are partly tumours of the mucous sheaths and bags (*bursarum mucosarum vaginalium, vesicalium* and *subcutanearum*) partly new formations, that is, serous cysts; they sometimes acquire a large size, and when of long standing, are often very hard, as the secretion contained in them becomes thick, albuminous, and jelly-like, even cartilaginous, and not rarely coagulated into little LOOSE CARTILAGES which are of various forms, and often in great quantity.[4] Similar LOOSE CARTILAGES, although in other respects mostly fibro-cartilage, and even bony in their centre or bony throughout, are not unfrequently found in other

serous and synovial cavities; they seem always to be formed in the above-mentioned tumours with necks of these membranes, and are therefore often found hanging by long fine threads, which at a later period are broken.[5]

(1) Compare above, § 51.

(2) *John* Chemische Tabellen des Thierreichs, p. 42—44. fol. Berlin, 1814. —*Schreger* fluidorum corp. animal. chemiæ nosologicæ specimen. p. 16—24. Erlang, 1800.—*Marcet*, A Chemical account of various Dropsical Fluids, in Med. chir. Trans. Vol. II. p. 342.—*Berzelius*, *ib.* Vol. III. p. 251.—*Bostock*, *ib.* Vol. IV. p. 52.—Annals of Medicine, Vol. VI. p. 126, &c. The water is sometimes clear, at other times turbid, milky, yellow, merging to greenish, brownish, reddish, from the mixture of blood, often quite thin, or rather thickish, like white of egg; sometimes it is so acrid, that pustules on the hands are produced by it, &c.

(3) *Juncker* D. de gangliis generatim consideratis. Halæ, 1740.—*Eller* in den Schr. der Berl. Akademie d. Wissench. p. 108. 1746.—*de Büchner* D. de gangliis. Halæ, 1748.—*Vinckler* D. de ganglio. Budæ, 1783.—*de Reimer* D. de ganglio. Duisburg, 1796.—*Assalin* Considérations sur les tumeurs des bourses ou capsules muqueuses du genou. Strasburg, 1803.—*J. Clocquet* in Archives générales de Médecine, Vol. IV. Paris, Feb. 1824. A case of a very large ganglion under the knee, where, as well as on the hand and on the tendo achillis, it is most common, is given by *Suchet* in Journ. compl. du Dict. des Sc. Médicales, Vol. XI. Cap. 43. Ganglions most generally originate in blows, pressure, violent extension, &c. although also from internal causes, particularly gout, rheumatism, scrofula, and painters' colic. Ganglions are also very common in the tendinous sheaths of the flexor muscles of horses, and are called *windgalls*. In asses and mules they also occur, though rarely; but in other animals they have not been observed within my knowledge.

(4) *Albinus* in Annot. academ. lib. VII. c. 15.—*Monro*, Description of all the bursæ mucosæ of the human body. fol. Edinb. 1788, translated into German, with notes, by *Rosenmüller*. p. 66. fol. Leipz. 1799, pl. 15.—*Wedekind* in the Annalen der Wetterauischen Gesellschaft f. d. ges. Naturkunde. Vol. I. Part I. No. 4.—*Abernethy*, Surgical observations.—*Beauchene* in Journ. de Médec. Chir. et Pharm. Oct. 1813. Vol. XXVIII. p. 137.—*Clocquet.*—*Cruveilhier*, Kystes contenant de petits corps blancs, in Essai sur l'anat. patholog. Vol. I. p. 306, relates ten cases from *Dupuytren*, *Pelletan*, *Patissier*, &c.—I saw at Mr. *Wardrop's*, in London, fifty such cartilages from a ganglion on the back of the hand, and above one hundred roundish pieces and little linseed-like cartilages in the Museum of *Ch. Bell.*—*C. M. Fuhrmann* D. s. variorum auctorum observata de tumoribus cysticis humorem synoviæ similem et corpuscula cartilaginea continentibus. Jenæ, 1822.

(5) v. more particularly below, in several places.—Compare *Laennec*, Art. Cartilages accidentelles in Dict. des Scienc. médicales, Vol. IV. p. 123; *Meckel* Handb. der pathol. Anatomie. Vol. II. Part II. p. 198—214; *Cassan* Notes sur les concrétions dites albumineuses, in Archives générales de Médecine, May, 1826.

SECOND CHAPTER.

Of Mucous Membranes.

§ 83.

As the MUCOUS MEMBRANES form the internal boundaries of animal bodies, they can only be WANTING, when the organs

which they line do not exist; their partial DEFICIENCY can only be acquired and not long continued. The EXCESS OF FORMATION of the mucous membrane occurs but rarely; we must here include the congenital irregular length of some of the mucous folds, also the congenital closing of the mucous canals at their usually open extremities, or at other parts by cross bands; unnatural mucous membranes are also formed in all irregular cavities and canals, which, like the normal mucous membranes, are connected with the surface of the body, or tend to represent them at certain spots, as in abscesses and fistulas; finally, the MUCOUS MEMBRANES ARE COMMONLY REPRODUCED, if they have been destroyed, either of the usual kind, or somewhat changed, as by a cicatrix.[1]

(1) The reproduction of mucous membrane does not appear to me to be doubtful, as it is not an unfrequent occurrence, for instance, in the mouth, the nose, and the vagina; in the alimentary canal it appears also to be reproduced, although generally somewhat changed; at least I have seen newly produced skin on certain spots of an intestine which has been affected by ulceration in dysentery, although without true villi, yet villous-like, and it may be said further, with little mucous glands. [In examining the body of the late M. Beclard, who had some years previously been affected with gastric disease, supposed to be chronic inflammation, there was found in the lesser curvature of the stomach, a cicatrized ulcer, about the size of a sixpence, with a flat surface, and traversed by a solid cellular band, on each side of which were two lacunæ formed by peritoneum; the margins were neither red nor swollen, and the rest of the stomach was sound.—v. *C. Billard* De la membrane muqueuse gastro intestinale. T.]

§ 84.

Mucous membranes assume, together with the canals which they line, the most varied FORM and SIZE, as they CONTRACT themselves, even to the closing of their canal, and on the contrary are capable of great EXTENSION; sometimes they alone are expanded, and project like bladders through clefts in the surrounding parts.[1] Their THICKNESS as an individual formation varies exceedingly, and is often very much diminished, either locally or generally, by excessive extension and atrophy, as well as increased to a great extent by hypertrophy, and still more by disease. The COLOUR is frequently irregular, sometimes it is too pale in the atrophic state of the membrane; white from the effect of sulphuric acid; frequently red in the most various shades and extent, as a consequence of irritation, congestion, effusion of blood on the surface, and inflammation;[2] and in consequence of the latter disease, sometimes also brown, slate-coloured, and in the mortified state and melanotic deposits, even blackish; the mucous membrane may also sometimes be irregularly coloured by food, drink, and medicines containing pigment.[3] RUPTURE of the mucous membrane,

merely from violent extension, is very rare, more commonly it is wounded by sharp bodies thrust into it, especially in the alimentary and urinary canals.

(1) For instance, in the air-tube, the alimentary canal, the urinary bladder, &c.
(2) The redness is sometimes produced merely by certain large vessels filled with blood, as if they were injected; in other cases it appears in little spots, in others streaky, speckled, or as it were washed, &c.
(3) v. further below, in the alimentary canal.

§ 85.

We observe, not unfrequently with reference to their DISEASES, a great sympathy in the mucous membranes of different parts with each other, and particularly also with the external skin; thus they are often found affected altogether more or less by exanthematous diseases, by continued fevers, &c., and VICES OF TEXTURE are very common in them. The latter, as is generally the case, so also here, frequently, arise from INFLAMMATION of the mucous membrane, which has a peculiar character, is called *inflammatio catarrhalis*, and shows itself in lower degrees of the disease by moderate redness, swelling, and increased secretion of the mucous fluid; in higher degrees by more excessive redness and swelling, connected with dryness, or with great disposition to the effusion of fibrous matter. This produces the PLASTIC SPOTS of various kinds,[1] or gives rise to ADHESIONS of the mucous membranes to each other, and so to the closing up of their canals. Inflammation of the mucous membrane has often consequent to it, SOFTENING, SPONGY LOOSENING, ŒDEMA, FLABBINESS, and FOLDS; in other cases SWELLING, with infiltration of coagulable lymph, consequent THICKENING and HARDENING, even of a cartilaginous character,[2] in all which states a speedy coalescence, and even imperviousness of the canals lined by the mucous membrane, is readily produced. The higher, more phlegmonous degree of inflammation, not unfrequently runs into SUPPURATION and MORTIFICATION, in the latter of which, large pieces of the mucous membrane are sometimes separated from the adjoining parts, and thrown off. OSSIFICATION of the mucous membrane alone does not appear to occur.[3]

(1) Compare § 55.—THRUSH, *Apthæ*, are a peculiar kind of such false membranes which occur in the mouth, gullet, and stomach, and are situated on or beneath the epithelium of the mucous membrane, and have very various form and colour.—*Lelut* Mémories sur le muquet, in Répertoire général d'anat. et de physiol. pathol. Vol. III. Part I. p. 145.—[*G. Macilwain*, Surgical observations on the more important diseases of the mucous canals of the body. 8vo. Lond. 1830. T.]
(2) Here also belong the changes which affect the mucous membrane of protruded parts. v. above, § 78.—[v. *Andral* Précis d'Anat. Path. Vol. I. p. 266. T.]

(3) The few instances of ossification mentioned by writers appear to me either to have their seat in the cellular tissue investing the mucous membrane, or to be an earthy deposit on their expanded surface, and in the mucous glands. It has not been my luck to find true ossification of this membrane, nor to see it in any collection, and this great analogy with the external skin induces one to believe in the want of this vice of texture.

§ 86.

Among the compound vices of texture of the mucous membrane must be first named, especially, the EXANTHEMATOUS DISEASES not unfrequently observed in many parts, as the BRAN-LIKE SCALING of their epithelium, the various kinds of SPOTS, KNOTS, PUSTULES, VESICLES, and even the true POCKS, &c.; further, the VARICES and degenerations of the blood-vessels found in them, then the great DEVELOPMENT, EXTENSION, SUPPURATION, which occur in the MUCOUS GLANDS contained in them, especially in chronic catarrh and mucous fevers; finally also, a number of SPURIOUS FORMATIONS. To these belong the HAIRS, which in rare cases are produced upon them, HYDATIDS, the more rare peculiar ENCYSTED TUMOURS, TUBERCLES, FUNGOUS GROWTHS, and the POLYPS, which are very common on many places, as well as the SARCOMATOUS TUMOURS allied to them, and finally, SCIRRHUS and CANCER, which particularly affect those parts of the mucous membrane in which there are many mucous glands.

§ 87.

The CONTENTS of the mucous membrane lining cavities also present irregularities. To these especially belong the peculiar SECRETIONS OF GAS, varying in quality and quantity, and of WATER, which can sometimes be retained for a long while in certain regions in the morbid interlacing of the muscular parts surrounding mucous membrane; further, of MUCUS, which is frequently collected in incredible quantity, sometimes thickish and viscous, like frog spawn or white of egg, even forming tubes, but in other instances, has a purulent appearance, and indeed in the alimentary canal is not unfrequently mixed with the various morbid excretions, and coloured by them; then of BLOOD, which not unfrequently may be equally poured out upon the mucous membrane without rupture of the larger vessels, in inflammatory, hemorrhoidal, and other conditions of the membrane; finally, of EARTHY[1] and SALINE substances of various kinds, which are found upon them either in a fluid form, or coagulated and formed into incrustations and stones, which are produced in the canals of the mucous membrane especially. INTESTINAL WORMS are also very commonly

produced, both in man and animals, in the cavities formed of mucous membrane, and where they open externally, we find also various other ANIMALS and DEAD EXTRANEOUS SUBSTANCES.

(1) I know one person, in whom, during an atonic attack of gout, the whole mouth, throat, and gullet were largely covered with a whitish mucus, which, when dried on blotting paper, left behind a large quantity of phosphate of lime.

THIRD CHAPTER.

Of External Skin.[1]

§ 88.

As no organic body can exist without a covering, so DEFICIENCY OF THE EXTERNAL SKIN CAN NEVER EXIST AS A VICE OF FORMATION: but it is so much the more common as an acquired vice, since large patches of skin are often destroyed by suppuration, mortification, burns, &c. The formation of the skin is, however, frequently seen imperfect, so far, as that in man and animals it is often found at the time of birth as thin and transparent, on certain spots, as in the youngest embryon, and then, in consequence of its simultaneous connexion with the subjacent membranes, it appears at first sight to be really deficient. This is most common in hemicephaly, *spina bifida*, and the clefts on the front of the body, in which internal pressure prevents the evolution of the skin.[2]

On the contrary, we sometimes also observe an EXCESSIVE FORMATION OF SKIN, in which are seen, on certain parts, as congenital vices both in man and animals, unnatural PROCESSES OF SKIN; and as acquired vices, ENCYSTED TUMOURS, especially those which are internally beset with hair, are frequently formed of a membrane very analogous to the cutis.[3] The skin is also very easily reproduced,[4] after having been destroyed by disease or operation; but at such spots it generally becomes changed, viz. is thin, expanded, at first red, but subsequently white from poverty of vessels, has neither hair nor sebaceous glands, and is then called a SCAR, *cicatrix*.[5]

(1) *Plenk* Doctrina de morbis cutaneis. Vindob. 1776.—*Lorry* De morbis cutaneis. Paris, 1777.—*Jackson*, Observations on the diseases of the skin.—*Schmidt* Cutis morbi ex materiæ animalis mixtura et forma mutatis cognoscendi D. Halæ, 1799.—*Willan's* Description and treatment of cutaneous diseases. 4to. Lond. 1798.—*Alibert* Description des maladies de la peau observées a

l'hôpital Saint-Louis, etc. fol. Paris, 1806—1826, with plates.—*Bateman*, Practical synopsis of Cutaneous Diseases, according to the arrangement of Dr. *Willan*, illustrated by a coloured plate. 3d edit. London, 1813; and Delineations of the Cutaneous Diseases, &c. 4to. London, 1814—1816.—*Nushard* Skizze einer Dermato-Pathologie. 8vo. Prag. 1816.—*Bergmann* die Krankheiten der Haut, der Haare und Nägel am menschl. Körper. 8vo. Leipz. 1824.—*Klaatsch* Tabellarische Uebersicht der Hautkrankheiten nach *Willan's* System. fol. Berlin, 1824.—*Plumbe* A practical treatise on Diseases of Skin, &c. 8vo. London, 1824.—*Rayer* Traité théorique et pratique des maladies de la peau, etc. Paris, 1826, with an atlas.—v. *de Plouquet* Repertor. Cutis morbi. [*Craigie's* Elements, p. 604. T.]

(2) I have already observed, in the above cases, that the common integuments covering the other membranous sacs are not deficient, but only thinned; and this will be found to be confirmed subsequently by a host of cases; I have always endeavoured to distinguish the thinned skin from the subjacent fibrous or serous membranes, and often also to separate them.—Compare my Monstror. sex humanor. anat. et physiol. disquis. p. 12.—Selt. Beob. Part I. p. 26.—Handb. der pathol. Anatomie. 1st edit. p. 152.

(3) For instance, my Selt. Beob. Part II. p. 159.

(4) I once saw the skin of the whole belly from the navel, of the penis and testicles, and a part of that of the thigh, soon reproduced, after having been destroyed by gangrene, consequent on a syphilitic bubo.

(5) Compare § 56.—From the appearance of the scar, we can sometimes distinguish the character of the preceding ulceration of the skin, whether it had been a scrofulous, syphilitic, or variolous ulcer which had given rise to the scar, &c.

§ 89.

The EXTENT, THICKNESS, and FORM[1] of the skin is subject to great variety. Sometimes it is found congenitally so NARROW, as to produce STRICTURES and deep INDENTATIONS;[2] it is more frequently narrowed and shortened in consequence of a diseased state, especially in the destruction of burnt parts, tumours, and wounds, with loss of substance, so that it restricts the motions of a part. Oftentimes the skin is too WIDE, WITHERED, and WRINKLED, sometimes to a very great extent;[3] in many cachectic diseases;[4] and when it has been previously very much expanded by tumours, this is especially the case. The EXTENSIBILITY of the skin is very great, particularly if it have been long in taking place. With great extension there also occurs THINNING of the skin, and sometimes to such extent that it becomes quite smooth, shining, transparent, and similar to a serous membrane, and then not unfrequently BURSTS. Not less common is also the THICKENING of the skin in consequence of various diseases, for instance, badly cured erysipelas, elephantiasis, &c. in consequence of which it can be thickened to a quarter of an inch. There is also commonly found at the same time, HARDNESS, which, however, may exist without any thickening, and is occasionally so great, that the skin becomes as dry and firm as tanned leather or parchment, not unfrequently breaks and produces CRACKS, *rhagades;* the skin is also found in many men, for

instance, sometimes in barren women, naturally too hard and rough. The contrary vice of consistence, viz. the SOFTENING and LOOSENING of the skin, occurs in many diseases, on parts which have been long deprived of the influence of air and have continued moist, in habitual sweating, and on the hands of little children, who are accustomed to suck them, &c.[5]

(1) Many muscles alter the form of their shell to that of the body, on which they fasten themselves.

(2) I have twice observed deep circular strictures on the thigh and leg of new born children. One such case has been described by *Cornelison* in the Medical Repository of Original Essays and Intelligence, New York, 1817, new ser. Vol. IV. Part II.

(3) One young man could draw the skin of the neck and shoulder over the whole face. v. *Tulpius* Observ. medic. p. 100. Amstel, 1672.

(4) For instance, the disease Cosz, in the country of Nogays, between the Black and Caspian seas.

(5) A few remarkable cases of softening and dissolution are communicated and drawn by *Heusinger* in the first Bericht. von der anthropotomischen Anstalt zu Würtzburg, p. 34. ff. plate 3. Similar strong development of the papillæ of the skin have been often noticed in elephantiasis, under the thickened cuticle.

§ 90.

The COLOUR[1] of the skin presents very many variations from the normal state, which are usually situated only in the upper layer of the cutis itself, although in rare cases in the cuticle also at the same time; these are sometimes general, sometimes only local. Too GREAT WHITENESS of the skin occurs originally and often hereditarily in LEUCÆTHIOPY, or ALBINOISM of men and animals,[2] and rarely as a bleaching in the coloured nations;[3] the YELLOW colour, as a morbid state in JAUNDICE, *icterus;*[4] the RED colour, particularly in high inflammation, and in the eruptive diseases, although also without these.[5] There is observed further in Europeans a BROWNISH,[6] in rarer instances a LEADEN,[7] more commonly a BLUISH,[8] and even a BLACKISH[9] state of the skin, partly as the consequence of a morbid state, partly from certain colouring substances.[10] We also not unfrequently observe upon the skin, SPOTS of various colour, number, size, and form; for instance, Europeans with the skin entirely white, yellow, red, brown, and blackish; coloured nations, on the contrary, with light spots.[11] Here belong also SUN-BLISTERINGS, *ephelides;* FRECKLES, *lentigines, cloasmata;* the BLACKISH SPOTS IN OLD PERSONS, *melasmata;*[12] then the bluish and dark spots which arise from congestion or from actual effusion of blood in and beneath the tissue of the skin, as death spots, sugillations, petechiæ, scorbutic spots, &c.;[13] and finally, the various spots in which, at the same time, the skin is morbidly changed. In animals also, we sometimes observe morbid spots on the skin,

particularly in the murrain among swine, sheep, fishes without scales, viz. eels, even in crabs, silkworms, &c.

(1) *Blandus* De maculis corporis. 4to. Romæ, 1544.—*Fr. Hoffmann* D. de morbis cum colore cutis depravato. Halæ, 1714.—*Bose* De mutato per morbum colore corp. Lips. 1785.—*Blumenbach* De generis humani varietate nativa. p. 150. edit. tertia. Gotting. 1795. ff.

(2) Compare § 33. *Blumenbach*, § 78, p. 274, and in Comment. Soc. Reg. Scient. Gotting. Vol. VII. p. 29, and in the Medic. Bibliothek. Vol. II. p. 537.—*G. T. L. Sachs* Historia natur. duorum leucæthiopum auctoris ipsius et sororis ejus. 8vo. Solisbaci, 1812, accompanied with observations by *Schlegel* in Neuen Materialien für die Staatsarzneiwiss. Vol. III. p. 1—148.—*Mansfeld* Ueber das Wesen der Leukopathie oder des Albinoismus, nebst Beschreibung eines in Braunschweig lebenden Albinos. 4to. Braunschweig, 1822, with a plate.—*A. Retzius* Bericht über zwei schwedische Albinos, nebst Bemerkungen über die Pigmentbildung in *Svenska Läkare-Säslskapets* Handlingar. Vol. X.—Description of an Albino which was born at Görlitz, by Dr. *Bauernstein*, in Neuen Lausitzer Magazin. Vol. V. Part III. Gorlitz, 1826. v. also § 33, note 2.—[*J. R. Cox*, an account of an Albino, in a note to which, *Jefferson's* account of three Albino negro women in the same family, in *Cox's* Philadelph. Med. Mus. Vol. I. p. 151.—*J. Vaughan*, account of two Albinos, in *ib.* Vol. II. p. 285. T.]

(3) Partly in congenial climates, partly in disease. v. *Blumenbach*, p. 160 and 161, and in *Voigt's* Magazin, Vol. V. p. 368. Recent instances of bleaching in the negro, are given by *Fisher* in Mem. of the Soc. of Manchester. Vol. V. Part I. p. 314.—*Hamilton* in Edinburgh, Med. chir. Trans. 1824, No. 22.—*Dwight*, Travels in New-England and New-York.—Another case in the Norfolk Beacon.—Bleaching of Americans is described by *Dwight* and *Knight* in Transact. of the physico-medical Soc. of New York. Vol. I. 1817.

(4) v. § 39.—*Desmoulins* De l'état anatomique de la peau et du tissu cellulaire dans la fièvre jaune, etc. in *Magendie's* Journ. de Physiol. experim. Vol. III. No. 3. p. 255.

(5) For instance, a red negress. *Marcgravii* Brasil. p. 12.

(6) *Frank's* Kleine Schriften medic.-prakt. Inhalts, a. d. Lat. v. *Eyerel*, p. 274. 8vo. Leipz. 1810.—*Johnson* in London med. chir. Transact. Vol. XIII. Part I.; sometimes also in jaundice.

(7) *Hagedorn* Hist. med. phys. Cent. III. Hist. 56.

(8) Especially in the blue disease, *cyanosis*; from grief, *Fardeau* in *Fournier's* Recueil de Mémoires de Médicine, Chir. et Pharmac. militaires. Vol. VIII. p. 237.

(9) Occurring especially in pregnancy and in disturbed menstruation; not unfrequently in several parts. v. *Albinus* De sede et causa color. æthiop. p. 9.—*Haller's* Elem. Physiol. Vol. V. p. 18.—*Blumenbach* De gen. hum. var. nativ.—*Heusinger* Untersuchungen über die anomale Kohlen-und Pigmentbildung, u. s. w. p. 58. Eisenach, 1823.—On the leg of a dropsical person, *Wurfbain* Misc. Acad. N. C. Dec. II. Ann. V. p. 325;—on the face, *Cassini* Mém. de Paris, 1702. Hist. p. 29.—*Yonge* in Phil. Trans. 1709, p. 424 and 432.—*Chomel* Bullet. de la Facult. de Méd. et de la Soc. de Paris, 1814, p. 113.—*Goodwin* in *Sedillot's* Recueil period. de la Soc. de Méd. de Paris. Vol. XLVI. p. 339.—from the breast to the knee downwards. *Rugieri* Storia ragionata di una Donna avente gran parté del corpo coperta di pile et pelle negro. 8vo. Vened. 1815.—*Wells*, Two Essays, &c. and an Account of a Female of the white race of mankind, part of whose skin resembles that of a negro. 8vo. Edinb. 1819.—*Parsons* in Philos. Transact. Vol. LIII.—General black colouring is noticed in *Ludwig* Epistol. ad *Hallerum* script. Vol. I. p. 393.—*Strack*, Observat. de febrib. intermitt. p. 194. 8vo. Offenb. 1785.—*Leske* auserl. Abhandl. Vol. I. p. 1.—*Chomel* in Journ. génér. de Méd. Chir. et Pharm. Vol. XXX. Jun. in Bulletin.—*Bernstein* in Salzb. medic. chir. Zeitung, 1813, Vol. IV. No. 87. p. 143; and in Kleinen medic. Aufsätzen. Frankf. 1814.—*Pascalis* in Medic. Repository, New York, 1817, Vol. IV. Part IV.—*Rostan* in *Leroux* Journ. de Méd. Chir. et Pharm. Vol. XL. Nov. and Decbr.—Bulletin de la Soc. de la Faculté de Médec. 1817, No. IX.

and X.—[*Chamseru* in Hist. de la Soc. Roy. de Méd. Vol. IV. p. 264, mentions the case of a child born with a violet-coloured skin, which gradually darkened to nearly black, on the lips, cheeks, tongue, interior of the mouth, and ends of the fingers; at the same time, the white of the eyes, and the irides more especially, became violet-coloured. The child was eight years old when the account of the case was given. T.]

(10) Compare § 38. *Baillie* also observed two instances of black colouring of the skin from continued internal use of the ARGENTUM NITRATUM. v. N. Samml. auserl Abhandl. z. Gebr. präkt Aerzte. Vol. IX. Part III p. 379.—Many muscles, viz. oysters, *plicatulæ*, *anomiæ*, *balani*, &c. change the colour of their shells to that of the bodies on which they are fastened. v. *Defrance* in the Annales des Sciences Naturelles. Vol. I. p. 16.

(11) The scars of coloured nations are at first lighter, but subsequently they become as dark as the original skin.—[Pied negro, v. *Morgan*, in Amer. Phil. Trans. Vol. II. p. 392. T.]

(12) *Bruckmann* in *Horn's* Archiv f. medic. Erfahrung. Vol. II. Part II. p. 247.

(13) I know a lady who has a weak chest, in whom oftentimes sundry large skin spots, of a beautiful cerulean blue, appear on the extremities, without the slightest cause, and when she is in perfect health; after several hours they gradually subside.

§ 91.

Among the VICES OF TEXTURE in the skin, INFLAMMATION, *dermatitis*, must be first mentioned, which is usually designated by the name of ST. ANTHONY'S FIRE, *erysipelas*,[1] and can exhibit very different degrees and peculiarities. In the higher degree of inflammation, the skin is not only ADHERENT to the parts beneath, but also to the external surface of other parts of the skin with which it is in contact.[2] This inflammation frequently runs into SUPPURATION, in consequence of which, ULCERS of the skin occur; these indeed present a very different appearance, according as they arise from external or internal causes, and in the latter case are, for instance, either of a syphilitic, scrofulous, or gouty nature.[3] THICKENING and HARDENING of the skin are also a very usual consequence of inflammation, which sometimes attains a very high degree, but never runs into TRUE OSSIFICATION, a condition which never occurs in the skin.[4] On the contrary, the skin is very subject to MORTIFICATION, in consequence of which large patches of it are destroyed. The skin also undergoes various kinds of degenerations in man and animals, in the ERUPTIVE DISEASES, both in the exanthematous and impetiginous, in which are produced the various kinds of spots, elevations, knots, pustules, bladders, scabs, chaps, &c. The texture of the skin is also sometimes more extensively changed in SCROFULA, SYPHILIS, PELLAGRA,[4*] RADESYGE, in EASTERN and WESTERN LEPRA, which may occur on almost all animals; so also may it be congenital in various ways, in the so-called MOTHERS' MARKS, *nævi materni*,[5] which, however, do not seem to occur in animals. The sebaceous follicles, *cryptæ sebaceæ*, found in the skin,

also not unfrequently appear somewhat diseased; thus they often become enlarged, especially in atrophic children, in whom the sebaceous matter is collected in too great quantity and hardness, and appears at the mouth of the follicle as a black spot, and may be squeezed out in form of a maggot, MAGGOTS, *comedones*, as they are called; BOILS, *furunculi*,[6] hard, very painful circumscribed tumours, in which are produced a viscid kernel or core, are usually seated in the sebaceous follicles, although they appear sometimes to be formed also in the cellular tissue of the skin. HAIR has been once found in a boil.[7] Sometimes CALCAREOUS CONCRETIONS[8] are formed in the sebaceous follicles. To the more distinct and important vices of texture of the skin belong ENCYSTED TUMOURS,[8*] which may be developed, if small, in the cellular tissue of the skin itself; the FATTY TUMOURS are the most common;[9] sometimes HORNY SUBSTANCES present themselves in a kind of bag of skin. Various FUNGOUS and SARCOMATOUS GROWTHS occur not unfrequently on the skin, as EXCRESCENCES, *condylomata*, the YAWS and PIANS,[10] certain SCROFULOUS GROWTHS,[11] the frequent SARCOMATOUS GROWTHS ON THE NOSE, and above all MEDULLARY SARCOM, which is not unfrequently seated in the skin, and the MALIGNANT WARTS and GIBBOUS TUMOURS,[12] which run into TRUE CANCER OF THE SKIN. In animals, of which the skin is consolidated into scales, crusts, &c., these often exhibit various diseases, thus curvings, abrasions, perforations, and wounds of different kinds;[13] growths, to which also especially belong, the brilliant PEARLS found on the inside of bivalve shells, &c.

(1) The lowest degree we commonly call also *erythema;* the highest, *erysipelas phlegmonodes.* Erysipelas is most common on the face and on the feet; its occurrence after operations is dangerous, and it resembles the state of the skin in scarlet fever. Inflammation of the skin frequently arises from wounds, blisters, burns, frost-bites, insect stings, from pressure in consequence of lying down, *decubitus*, &c. The galling or abrasion, *intertrigo*, of very fat persons and newborn children also belongs here, as well as in beasts, the so-called *ignis sacer, ferus, sylvestris, persicus, St. Antonii*, &c.

(2) For example, especially the fingers and toes after burns: in one instance, the fore-arm adhered to the lip.—*Cruveilhier* Essai sur l'Anatom. pathol. Vol. I. p. 181, the heel with the tuberosity of the ischium. — *Otto* Verz. d. anat. Präparatensammlung, No. 2902.—The adhesion of separate parts to each other is pretty frequent, and with the investing membranes of the fœtus. Observe in these the importance of the ready union of the skin for operative surgery.

(3) Compare § 57.—Here belong especially watery cancer, the corroding spots, *herpes exedens*, chimney-sweepers' cancer, and other malignant ulcerations of the skin.

(4) The bony concretion in the Cabinet d'Ecole de Médicine at Paris, which, according to the description, was produced in the skin of a young girl of eighteen; I found, on a closer investigation, in the year 1818, to be rather fat, almost like adipocire.

(4*) [Pellagra or the Lombard evil; the scherlievo, radesyge, spedalsked, liktraa, or the Northern evil; mal di rosa of the Asturias, and a cutaneous

disease prevalent in Crim Tartary, are all considered, by *Craigie*, as probable varieties of the same morbid action. v. his Elem. p. 640. He also gives the following authorities.—On the Pellagra, v. *N. X. Jansen* de Pellagra. Ludg. 1787; *Holland*, M. D. in Med. Chir. Trans. Vol. VIII. p. 317; on Radesyge, Morbus quem Radesyge vocant, etc. Commentatio Auct. *Fred. Holst*, M. D. Christianæ, 1817; Geographische Nosologie von *Fr. Schnuner*, *M. D.*; on mal di rosa, *Thiery* Observations de Physique et Médec. Vol. II. Chap. VI.; on Scherlievo, Annali de Medicina; for Crim Tartary diseases, the travels of *Falk*, *Guldenstadt*, and *Pallas*. T.]

(5.) *Reuss* De nævis maternis. v. Repertor. Commentat. Vol. X. p. 268, and Vol. XII. p. 332.—*de Plouquet* Repertor. Art. Nævus.—*Wienhold* Sieben Vorlesungen über die Entstehung der Missgeburten. Bremen, 1807.—*Krause* Abhandlung von den Muttermälern. Leipz. 1758.—*Jouard* Des monstruosités et bizarreries de la nature, etc. Paris, 1806.—A good plate of a mother's mark is to be found in *Alibert's* Nosologie Naturelle, Vol. I. pl. E, p. 350.—Another kind in *Walther*, Ueber die angebornen Fetthautgeschwülste und andre Bildungsfehler. fol. Landshut, 1814.—*J. Wardrop*, in London Medic. Chir. Trans. Vol. IX. Part I. — One kind of mother's mark is near akin to angiectasy, described in the vascular system.—No. 2877, of Bresl. Mus. exhibits a mother's mark affecting the back of the head, the neck, and the whole of the upper part of the back.—[*J. S. Elsholz* Anthropometria et Doctrina Nævorum. 4to. Pat. 1654.—*P. Phinella* Libri tres Nævorum. 12mo. Antw. 1632. T.]

(6) *Astruc* Traité des Tumeurs, I.—*Stahl* D. de abscessu et furunculo. Halæ, 1714.—*Berlin* D. de furunculo. Gött. 1797. — *Heim's* Erfahrungen über die Furunkeln in *Horn's* Archiv f. Medic. Erfahr. Vol. VII. Part I. and II. — *Ritter* in *Graefe's* and *v. Walther's* Journ. of Chir. Vol. III. Part I. p. 81.

(7) *Gilibert* Adversar. med. pract. p. 140. Lyon, 1791.

(8) *Voigtel*, Hand. der pathol. Anat. Vol. I. p. 85, describes a few very interesting cases from *Meckel's* collection. Also in the sebaceous follicles of brutes concretions are sometimes formed, viz. the so-called STAGS' TEARS, in stags, which even become bony. v. Eph. N. C. Dec. II. Ann. IX. Observ. 15, p. 45.

(8*) [The only kind of encysted tumours which occurs in the skin is, according to *Craigie*, the meliceris; v. his Elements, &c. p. 644. T.]

(9) Compare § 64.

(10) Good plates in *Alibert*, pl. 35 and 36. — *Ludwig* Histor. pathologica singularis cutis turpitudinis *Reinhardi*. fol. Lips. 1793, with engravings.

(11) For example, in *Adelson*, D. s. casum singularem morbi tuberosi, etc. 4to. Gött. 1822, with two engravings. A peculiar kind of fungous growth on the tip of the finger was observed by *Boerhave*, De morb. nervor. p. 282, and *Stiebel* Kleine Beiträge zur Heilwissenschaft, p. 111. 8vo. Frankf. a. M. 1823.

(12) *Alibert* gives good plates of such ulcers under the name of SCROPHULE CANCEREUSE; further, in the NOSOLOGIE NATURELLE, Vol. I. p. 548, pl. H, and p. 554, pl. K.

(13) If mollusca be penetrated by boring muscles and worms, they do not close the opening with lime, but with a yellowish insoluble animal substance.

§ 92.

PARASITIC ANIMALS[1] are very often produced in and upon the skin of man and animals; EXTRANEOUS BODIES also remain there either permanently or for a long time.[2] Frequently also there is noticed some PECULIARITY in reference to the SECRETION FROM THE SKIN, thus the PERSPIRATION,[2a] is produced only at certain parts, on one half of the body, acrid and corroding, or stinking, containing urine,[2b] unusually sour, or discoloured, reddish, yellow, green, bluish,[2c] even blackish[2d]—too thick, clammy, milk-like, &c.;[2e] further, bloody-sweat,[2f] and the ex-

cretion of the menstrual fluid through the skin; the SECRETION OF EARTHY AND SALINE MATTER, especially in gouty persons;[3] even the exudation of PURE QUICKSILVER, through the skin.[4]

(1) Compare § 70.

(2) For instance, gunpowder, which has been burnt in, and colouring matter used in tattooing.

(2[a]) [*J. Abernethy*, Surgical and Physiological Essays, Part II. An Essay on the nature of the matter perspired and absorbed by the skin. T.]

(2[b]) *H. Halford*, Urinous smell in the perspiration, v. Med. Trans. Coll. Phys. Vol. VI. p. 389.

(2[c]) [An instance of blue sweat is mentioned in *Southwell's* Medical Essays, Vol. III. p. 53. T.]

(2[d]) [A case of back sweat is mentioned in a paper, 'De morbo quodam sudoribus urinisque nigerrimis insigni,' in Comment. Bonöens. Vol. VI. p. 60. T.]

(2[e]) *Jahn*, Oily perspiration in general emphysema, Magaz. f. d. Gesammt. Heilk. Vol. XXVIII. p. 59.

(2[f]) [Bloody sweat is mentioned by *Blainville* in his Cours de Physiol. Gen. et Comp. Vol. III. p. 57. Paris, 1830, as occurring under severe mental excitement, and in the disease called Diapédèse, but he considers that "il n'y a pas une véritable transpiration, mais qui consititue plutôt une hémorrhagie par exhalation, comme celle que l'on observe à la surface de la membrane pituitaire." A very curious case of this disease is mentioned by *Samuel du Gard*, in Phil. Trans. Vol. IX. No. 109, p. 193. A child about three months old began to bleed from the nose, ears, and back of the head; in three days that from the nose and ears subsided; upon which the blood flowed more violently from the head, and streamed down to some distance. She bled also from the shoulders and waist, also at the shoulders, bends of the arms, hands, and toes. She died in six days from the commencement of the attack, and there appeared in those places where the blood came, little holes like the pricking of a needle. T.]

(3) *Albrecht* in Miscell. Acad. N. C. Dec. II. Ann. 1690, p. 144.—*Paullini* in App. Misc. N. C. Dec. II. Ann. V. Obs. 85.—*Bartholinus* Hist. anat. rar. Hafn. 1654, Cent. I, Obs. 34. Vol. II. p. 55.—Medicinisches Wochenblatt von *Müller* und *Hoffmann*, 1787, No. 10.—*Richter* Specielle Therapie, Vol. VI. p. 551.—Compare *de Plouquet* Repertor. Calculus in sudore. According to *Dandalo*, the sweat of gouty persons contains uric acid; thus the concretion might be urate of soda.

(4) Memoir of the medical Soc. of London, 1799. Vol. V.—*Brückmann* in *Horn's* Archiv f. med. Erfahr. 1810, Vol. II. Part II. p. 252.—*Biet* in *Kopp's* Aerztl. Bemerkungen, veranlasst durch eine Reise, u. s. w. p. 116. 8vo. Frankf. a. M. 1825.

FOURTEENTH SECTION.

Of Horny Tissue.[1]

§ 93.

The already mentioned vices of the skin lead very naturally to those of the HORN-LIKE PARTS which are most intimately connected with it, to wit, of the CUTICLE, of the *epithelium*, the various kinds of CALLOSITIES, HORNY WARTS, SCALES, and SHELLS of animals, the HORNY BEAKS, NAILS, TALONS, CLAWS,

HOOFS, true HORNS, so far as they do not belong to the bony system, the HAIRS, BRISTLES, SPINES, FEATHERS, &c. As these parts are all composed of the same substance, viz. horn; they have also the same vices, some only of them therefore will, on account of their various peculiarities, be treated of more at length below.

(1) *Rudolphi* Ueber Hornbildung in den Abhandlungen der königl. Akademie der Wissenschaften in Berlin, aus den Jahren, 1814—1815, p. 175. Berlin, 1818.—*J. F. Meckel*, Hornbildungen im Allgemeinen und insbesondere an der menschlichen Eichel, im D. Archiv für die Physiol. Vol. I. p. 298.

§ 94.

The ENTIRE WANT of the horny system cannot naturally occur throughout its whole extent; the PARTIAL DEFICIENCY, however, exists not unfrequently both as a congenital and acquired state, and may attack almost all the several parts of this system.[1] Deficient formation of the horny tissue is often connected with debility of the skin, as well as of the whole body; sometimes also, however, with peculiarity of race. The opposite vice, viz. EXCESS OF FORMATION OF THE HORNY TISSUE,[2] is commonly observed, and almost in every kind of variety; to this especially belong the existence of irregular HORNS and WARTS upon the skin. The former, the *cornua cutanea*,[3] are usually composed of a kind of encysted tumour, sometimes also in consequence of blows, pressure, wounds, burns, &c., frequently even without any distinct cause, but as mere growths of the cuticle; they occur on all parts of the body, although most commonly on the head; in old women, especially, they attain oftentimes an uncommon size and firmness, and are periodically thrown off and again renewed; sometimes several exist at the same time, or one is cleft in two, &c. In animals we also notice them, particularly in horses and sheep, and even in birds.[3] WARTS, *verrucæ*,[4] are little, mostly roundish, though sometimes also flat, pedicular, thread-like, or on the contrary, gibbous horny swellings, more or less deeply attached to the skin, which, in man and animals, are either separate and scattered, or in masses, and connected with other malformations of the skin, as for instance, with mothers' marks,[5] or they are observed covering entire parts,[6] even including almost the whole body. The latter occurs in the so-called PORCUPINE-MEN, or in the highest degree of ICTHYOSIS CORNEA, and in part appears to be hereditary.[7] If the horny tissue be destroyed on any particular part, it is REPRODUCED NATURALLY and WITHOUT DIFFICULTY, as soon as the separated skin has been reproduced; still the reproductive power is not the same in all horny parts; thus, the cuticle is always reproduced, the

hair with more difficulty, the nails with still more, &c. The opinion[8] that horny parts, viz. the hair and nails, grow after death, is founded on false accounts.

(1) I have more rarely observed, for instance, the deficiency of the horny excrescences, or chestnuts as they are called, on the insides of the legs of the horse, the size of which also varies very much. Their absence in the horse and mule is described by *Havemann* Anleitung zur Beurtheilung des äussern Pferdes, p. 194, 3d edit. Hannov. 1822; and *Greve* Bruchstücke zur vergleichenden Anatomie und Physiologie, p. 38. 8vo. Oldenburg, 1818.

(2) *Plenck* Lehre von den Hautkrankheiten, a. d. Lat. p. 141. 8vo. Leipz. 1789.—*Piccinelli* Memoria sull' origine e cura di quelle escrescenze impropriamente chiamate corna umane. 8vo. Bergamo, 1816.—*Meckel* in Handb. der pathol. Anat. Vol. II. p. 276. ff.—*Ernst* D. de corneis hum. corp. excrescentiis, quarum generali brevique notitiæ singularis casus de hominis cujusdam corneis excrescentiis adjectus est. 4to. Berol. 1819.—Many similar cases have been collected by *Plouquet*, Repertorium, Art. Corn. hominum.—Other instances are *Mannagetta* and *Detharding* in Misc. Acad. N. C. Dec. I. Ann. I. p. 103; Dec. III. Ann. V. and VI. App. 148.—*Lanzoni* Misc. Acad. N. C. Dec. III. Ann. IV. p. 152, on the forehead of a boy.—*Lauchmund ib.* 1673 and 74. p. 239, Dec. III. Ann. III. App. p. 109, on the top of the foot.—*Koenig ib.* Dec. II. Ann. X. 1691, p. 208, on the great toe.—*Goguelin* s. *Sedillot* Rec. périodique de la Soc. de Médec. de Paris. Vol. LIV. p. 96, on the back of the head.—*Rochefort* in Mém. de l'Acad. de Chir. Vol. III. Hist. p. 7, on the loins.—*Majorat* in Gazette salutaire de Bouillon. 1788. v. *Hufeland's* Annalen. Vol. I. p. 447, No. 109, on the forehead.—*Caldani* in Mem. di Verona. Vol. XVI. p. 127, on the head.—*Rigal* in Dict. des Sc. médical. Vol. IV. p. 251, on the breast-bone and on the tuberosity of the ischium.—*Alibert, ib.* two horns on the back of the head.—*Otto* Selt. Beob. Part I. p. 109, on the back of the hand.—*Bertrand* in Archives générales de Médecine, August 1824, on the head.—*v. Plönnies* in *v. Froriep's* Notizen, 1824, No. 135, p. 33, with plates, on the head; other cases, *ib.*—*Pensa* in Giornale medico Neapolitano, Settembre, 1825; *v. Froriep*, Vol. XVI. p. 89, one on the head, the other on the back. Vol. VIII. p. 112. Description and engraving of knobby growths on the hands and feet of Lorenz Ruff by *Behrends*, translated by Dr. *W. Soemmerring*, fol. p. 10. Frankf. a M. 1825, two cases on the head.—*A. Cooper*, in his and *Travers'* Surg. Essays, Part II. pl. 8. fig. 8 and 9.—*Wiesenthal* in New England Journ. of Medic. and Surgery. Boston, 1819, on the breast.—*Ansiaux* Clinique chirurgicale. Liege, 1816, on the forehead.—Medical Repository, New-York, 1819, n. series, Vol. V. Part I. on the head, very large and divided. I have seen two twisted horns, several inches long, from the head of a woman, in the Museum of *Ch. Bell* in London; another from the head in the Museum of St. Thomas's Hospital, London; another $2\frac{1}{2}$ inches long, and as thick as one's finger, from the back of the head, in the Ashmolean Museum at Oxford. Concerning horns on the glans penis, v. Penis.—[*Vic d'Azyr* Observation sur une corne humaine, in Hist. de la Soc. Roy. de Méd. Vol. V. p. 294.—*E. Home*, Observations on certain horny excrescences of the human body, in which are given Mr. Hunter's notions respecting the production of such excrescences. v. Phil. Trans. Vol. LXXXI. p. 95. T.]

(3) *Malpighi* found a horn hanging on the neck of an ox. v. Phil. Trans. 1684, p. 601. In oxen, especially in those of southern countries, the horns are not unfrequently attached merely by skin; in the Hunterian Museum, London, I saw a misshapen horny growth from the forehead of an ox, and a similar one in the Anat. Mus. at Oxford, hollow, an inch and a half in length, and an inch in diameter at the base. [*J. Parsons*, M.D. On a sheep shewn alive to the Royal Soc. in Nov. 1754, having a monstrous horn growing from his throat, &c. which weighed twenty-six pounds. Phil. Trans. Vol. XLIX. p. 183. T.] A very large horn from the side of a sheep. v. Museum regium Danicum *Olig. Jacobæi*, p. 6, engraved in *Valentin's* amphith. zootomicum, p. 130;

on the same place I found a smaller one, about four inches long. v. *Otto* Selt. Beob. Part I. p. 109. In the horse they have been several times observed, for instance, Commerc. litter. 1739, p. 212.—*Mannagetta.*—Acta phys. med. N. C. Vol. VII. p. 289,—a spiral shaped, as if turned, long, hornlike growth on the beak of a canary bird, v. Bemerkungen über einen monströsen Kanarienvogel, u. s. w. 4to. Hamburg, 1780, with engravings. I have also seen similar growths on the beak of a partridge; an enormously large horny growth on the pelvis of a dove is described and figured by *Rudolphi*, p. 183.

(4) Compare *Reuss* Repertor. Commentat. Vol. XII. p. 334.—*de Plouquet* Repert. Art. Verruca. — We loosely distinguish warts from their form and consistence Verruca vulgaris s. topica; V. pensilis s. Acrochordum; V. sessilis s. Porrum, s. Myrmecia; V. filiformis; V. rhagadoidea, &c.; the Verrucæ carneæ, madidæ, the Mariscæ, &c. do not belong here, but to the sarcomatous formations of the skin.

(5) I have seen this several times; amongst others, in a boy in the ALBERGO DE' POVERI, at GENOA, who had a mother's mark affecting the neck, the left side of the breast, and the greater part of the back, covered with black hair, and with horny warts and points.

(6) To this belongs, for instance, the so-called Leontiasis corniculata of *Sauvages*, Nosologia methodica, Part II. p. 417, tab. 3, in which he includes *Ash's* case, in the Phil. Trans. No. 176. To this belongs the case observed by *Behrends* and *W. Soemmerring*. v. above, note 2.

(7) *Machin*, in Philos. Transact. 1731, No. 424, p. 299. — *Baker*, *ib.* 1755, Vol. XLIX. Part I. p. 21.—*Tilesius* Ausführliche Beschreibung und Abbildung der beiden sogenannten Stachelschweinmenschen, u. s. w. fol. Altenburg, 1802.—*Buniva* in Mem. de Turin, 1809—1810, p. 364—403.—*Ascanius* in Journ. de Médec. etc. Vol. IV. p. 216.—*Lauth* Mémoires sur les frères Lambert, etc., in the Mémoires de la Soc. des Sc. de Strasbourg, 1811, Vol. I. p. 327. — *Stalpart van der Wiel* describes a similar disease in Obs. rar. Cent. II. Obs. 35.— *Martin*, in Medic. chir. Trans. Vol. IX. Part I. p. 52. v. *Cerutti* Pathol. anat. Museum. Part II. pl. 7. 8vo. Leipz. 1822, hereditary. — *Mansfeldt* Beschreibung einer *Ichthyosis cornea spinosa partialis* am Bauche eines Kindes, in Archiv f. medic. Erfahrung von *Horn*, *Nasse*, *Hencke* and *Wagner*, July and Aug. 1823, p. 1, with engravings. — *Lobstein* Compte rendu, etc. Part CXXXIX. No. 1071, describes, from the Strasburg Museum, a child entirely covered with warts. The case described by *Ernst*, although more confined, also belongs here. — *Haskel's Ichthyosis cornea*, v. New-England Journ. of Med. and Surg. Vol. VIII. No. 1, p. 1, Boston, 1819, v. Salzburger medic.-chir. Zeitung, 1820, Vol. II. No. 38, p. 178, appears to belong rather to Leontiasis.

(8) To wit, *Schubert* Ahndungen einer allgemeinen Geschichte des Lebens. Vol. II. Part I. p. 63. Leipz. 1806-7.—*Carus* Versuch einer Darstellung des Nervensystems, p. 39. 4to. Leipz. 1814.

§ 95.

On account of the simplicity and similarity of the horny tissue, it is not surprising THAT IT IS SUBJECT TO BUT FEW DISEASES. Among these must be enumerated the CHANGE OF COLOUR in deficient nutrition and in actual death; the DISCOLORATION which is sometimes only seeming, as parts composed of horn, if they be thickened, become dusky; sometimes there is an actual discoloration, as the morbid pigment produced in bodies is deposited in it; or colouring matter applied accidentally or purposely to the skin, hair, nails, &c., easily colours the horny substance in various ways. Further,

the VICES OF CONSISTENCE, in which the horny tissue sometimes, in a manner recalling the inflammation of the other tissues of animal bodies,[1] is very materially SOFTENED, swollen, and full of moisture; sometimes is irregularly dry, rough, and broken, whence are frequently produced VICES OF CONTINUITY, which show themselves as clefts, exfoliations, &c.

(1) Compare above, § 53, note 1.

FIRST CHAPTER.

Of the External and Internal Cuticle.[1]

§ 96.

The cuticle exhibits very great variation from its natural THICKNESS,[2] either original or acquired, in the development of the body; thus it is sometimes unusually DELICATE and THIN, but more frequently too THICK; the latter sometimes occurs simultaneously throughout the whole skin in barren and masculine-made women. Such irregularities are more usually the consequence of diseases; many scars, the healing edges of cancerous swellings, &c. are indeed overspread with a thin external skin, which is usually so fine, that a smarting sensation of the skin is the consequence.[3] Very frequently we observe, in consequence of diseases of the skin, especially of the inflammatory kind, an increased deposition of layers on the inner surface of the cuticle,[4] whereby it sometimes acquires a very considerable thickness, even that of an inch,[5] as well as growths of many kinds; most frequently the thickening occurs on particular spots in consequence of friction, pressure, &c., and is then named CALLOSITY, *callus*, *tyloma*;[6] and on the feet, especially on the toes, where like a pointed nail it buries itself deeply in the subjacent skin, whilst its upper surface is broad and projecting, and is then called a CORN, a HORNY SUBSTANCE, *clavus*, *gemursa*, *helos*.[7] Vices of thickness are usually connected with VICE OF CONSISTENCE; thus, for instance, we observe the skin on parts which are moist, in the neighbourhood of ulcers, beneath plasters, at parts where there is habitual perspiration, &c. irregularly soft, and on the contrary, also under many conditions, especially at the same time with thickening, TOO HARD, DRY, ROUGH, so that it presents, CLEFTS, *rhagades*, INEQUALITIES and GROWTHS of various kinds, and

both looks and feels like the bark of a tree;[8] this is especially the case in syphilis, icthyosis, elephantiasis, &c. The COLOUR of the cuticle is sometimes irregular, inasmuch as generally it not merely participates in the discoloration of the cutis, but also of itself assumes an unnatural colour,[9] and can very frequently be coloured in different ways, by the introduction of colouring matter, accidentally or purposely;[10] lastly, the cuticle commonly exhibits VICES OF CONTINUITY, thus it is either separated from the subjacent cutis by contusions, by the operation of blisters, and by many diseases, especially pemphigus, and is elevated in form of larger or smaller bladders filled with blood, lymph, and pus, or it is separated without forming any such bladders, in shape of bran, scales, even of entire sleeves, stockings, &c. This commonly occurs after eruptive diseases, for instance, erysipelas, small-pox, scarlet-fever, icthyosis;[11] is even periodical; the consequence of poison,[12] and the like. In animals we also observe this desquamation;[13] and such of them as are naturally subjected to a change of skin at certain periods, as snakes, lizards, insects, viz. silkworms,[14] exhibit indeed many irregularities with reference to these changes. In rare cases the internal cuticle or epithelium, has been observed to scale off, to wit, in the intestinal canal of a badger[15] and of a mangy dog.[16]

(1) *Leidenfrost* D. de epidermidis humanæ natura et morbis. Duisburg. 1785. v. Opusc. Vol. IV. No. III. Compare the writers on diseases of the skin. Concerning diseases of the epithelium, v. *Lelut*, in Repert. gen. d'Anat. et de Physiol. pathol. Vol. III. Part II. p. 161. 1827.

(2) This appears also to be the case with the epithelium.

(3) *Osthoff* in *v. Siebold's* Chiron. Vol. II. p. 505.

(4) I have seen this also occur in the epithelium of the mouth and gullet after scalding with boiling water and sulphuric acid. Probably also, in *Ash's* case, the air-tube was thickened by external horny growth of the epithelium, as *W. Soemmerring* rightly imagines, p. 10.

(5) In one instance was the skin of the foot and hand so thick, v. *Gardane*, in Gazette de Santé, 1773, p. 23.

(6) *Leeuwenhoek* in Philos. Transactions, 1722, p. 156.—*Lordat* in *Sedillot* Recueil période de la Soc. de Médec. de Paris. Vol. XXII. p. 427.—*Nürnberger* D. de cuticula e frictione comprimente callosa. Viteb. 1789. In animals, not unfrequently from the pressure of the harness; for instance, on the neck of oxen. Clavus boum *Columella.* Vol. VI. p. 14.

(7) *Wedel* D. de clavo pedis. Jenæ, 1675.— *Camerarius* D. de *Gemursa* Pliniana, clavi pedis maligniori specie. Tub. 1722.—*Lochner* De clavi in pedibus maligna specie, etc. in Ephem. A. N. C. Cent. I and II. p. 419.—*van der Haar* Berigt om exter-öogen in Verhandl. van het Maatsch. te Haarlem. D. XIII. Part I. p. 605.—*J. Wardrop*, in Med.-chir. Trans. Vol. V. p. 129.—*Lion*, Complete Treatise upon spinæ pedum. 8vo. London, 1802, with engravings.—[*D. Low*, Chiropodologia, or a scientific inquiry into the causes of corns, warts, &c. 8vo. London, 1785.—*A. Carlisle*, Observations on the nature of corns, and the means of removing them, in Med. Facts and Observations, Vol. VII. p. 29. T.]

(8) *Vater* Pr. de cuticula pueri 15 annorum, cutis rhinocerotis aut corticis arboris instar incrassata, quotannis decidua. Viteb. 1735. In a calf without

hair, all the skin was covered with scales. v. *Fresier* in den Mém. de l'Acad. 1722, p. 21. In negroes, the cuticle on the sole of the foot is often thickened and burst from the heat of the soil. v. *Mercurialis* De decoriatione, p. m. 103.—*Blumenbach* De generis hum. varietate nativa. p. 246, note 6.

(9) To wit, the blackish tinge in a new-born child, which, after three weeks, is lost in the black colour of the cuticle. *Bernstein* in der Salzb. medic. chir. Zeitung, 1813, No. 87, p. 143.

(10) We observe the hands of dyers, the colouring of the cuticle from poultices, plasters, from steeping in a solution of lapis infernalis, the accidental colouring of the skin of many nations with carthamus tinctorius, bixa orellana, &c.

(11) In my younger days, I had once to treat a person with this disease, in whose bed I found, every morning, three pints of such scales.

(12) For instance, arsenic.—*de Haen* Rat. Med. Part X. p. 2. § 7.

(13) In many diseases. Camels sometimes lose the whole sole of the foot in wet ground.—*Pallas* Neue Nordische Beiträge. Vol. II. p. 160. [It has also occurred, that after the operation of nerving horses, proposed by Mr. Sewell, and often attended with success, the hoof has been thrown off. T.]

(14) *Bergmann* Primæ lineæ anat. comparat. p. 27.

(15) *Rudolphi* Anat. physiol. Abhandl. p. 46.

(16) *Hedwig* in *Isenflam's* and *Rosenmüller's* Beiträgen, Vol. II. p. 54.

SECOND CHAPTER.

Of the Nails and Hoofs.[1]

§ 97.

In rare cases the nails are WANTING originally;[2] this especially occurs in the imperfect development of supernumerary fingers and toes. Sometimes also a GREATER NUMBER of nails is seen, so that one finger or toe exhibits, with other traces of duplication, even two nails; it is said that many Chinese have two nails on the little toe.[3] Their SIZE, THICKNESS, and FORM, is often irregular;[4] thus are they found congenitally TOO SMALL and TOO THIN, or become so in later years, as the consequence of deficient nutrition, as in paralytic persons; in horses a hoof may be too narrow, the so-called NARROW-HEELED HOOF, so also is the SHRINKING and CONTRACTION of the hoof, not an unfrequent vice. Often we find the contrary, viz. the increase of the nail with thickening, very great elongation, claw-like curving,[5] &c. This sometimes occurs simultaneously with the increase of other horny organs,[6] although it may also occur alone; it is often caused by incessant cutting and rubbing; and is not unfrequently seen in animals.[7] Irregular enlargement of the nail, and pressure causes its CONVERSION INTO FLESH.[8] Frequently also are nails con-

genitally malformed; to this especially belongs the CONSOLIDATION of two, three, and four nails on connected fingers and toes.[9] In many diseases, the form of the nail also is changed; thus, for instance, in the blue disease, the entire tips of the fingers and toes become unusually large, broad, and curved;[10] in consumption they become curved and arched in a peculiar way, either in the early or very last stage of the disease;[11] in lepra, mishapen,[12] &c. Newly produced nails are also frequently very much malformed.

(1) *Plempius* De affectibus capillorum et unguium. 4to. Sorau. 1662.—*Werner* D. de unguibus humanis, varioque modo, quo possunt corrumpi. Lips. 1773.—*Nürnberger* Meletemata super digitorum unguibus. 4to. Wittenb. 1786.—*Blech* Tractatio de mutationibus unguium morbosis. 4to. Berol. 1816, with engravings.—*Ozanan* in Annales cliniques de Montpellier, Juillet, 1822.—*Royer Collard* in Repert. général d'Anatom. et de Physiol. pathol. Vol. II. p. 199, pl. 6 and 7.—*Bergmann* Die Krankheiten der Haut, der Haare, und Nägel. 8vo. Leipz. 1824.—*Coleman*, Observations on the structure, economy, and diseases of the foot of the horse, Vol. I. and II. 4to. London, 1801 and 1802. Compare also *Camper*, on the best form of the shoe, and *Wardrop*, an account of some diseases of the toes and fingers, &c. in Med. chir. Transact. Vol. V. p. 129, and the writings of the Chiropedists.—*A. Cooper*, in Lond. med. and phys. Journ. April, 1827. [*M. Hall*, Commentaries on some of the more important diseases of females. 8vo. London, 1827. T.]

(2) For instance, in a monster in the Museum at Berlin; on all the toes in a monster in the Bresl. Mus. v. *Otto* Verzeichniss der anat. Präparatensammlung, No. 2888.

(3) *Neuhoff* Gesandtschaft an den tartarischen Chan, u. s. w. p. 263.

(4) *Franck de Franckenau* D. de unguibus monstrosis, etc. Hafniæ, 1716.—*Rouhault* Observation anatomique sur des ongles monstrueux in Mém. de Paris. A. 1719. Hist. p. 38.

(5) Old examples in *de Plouquet* Repertorium Art. Unguis; *Haller* Elem. Physiol. Vol. V. p. 30.—in *Blech.*—A case, *Henning*, in *Horn's* Archiv f. med. Erfahrung, 1823, Septbr. u. Octbr. p. 205. fig. 2 and 3.—*Lion* gives several plates of very ill-formed nails, pl. 1 and 2; I have also seen several very large. In the Bresl. Mus. in a monster, No. 2888, is a part of the left hand very long and clawlike. In the Museum at Freyburg, I saw all the nails of one hand remarkably large. [*Locke* in Phil. Trans. Vol. XIX. p. 594. Nails on most of the fingers and toes four inches long, and other horny growths on the back of the hands, in a boy of twenty years old.—*R. Wroe.* Case of a boy in which, within a twelvemonth, the nails of the left hand grew to the length of two inches, "with great quicks or roots under the nails," which were painful when cut, but not otherwise; subsequently they grew on the fingers of the right hand; on both hands they seemed to acquire their full growth in twelve months, then fell off without pain, and were reproduced. It is further mentioned that "he was miserably overspread with leprosy," probably ichthyosis. v. Phil. Trans. Vol. XXIV. p. 1899. In the Museum at St. Thomas's Hospital there are two nails about two inches in length, very much curved, and extending far beyond the ends of the fingers, and I remember it used to be mentioned at the lecture that they were so extremely sensitive, that any attempt at cutting them was attended with severe pain, but I have no further history of them. In *Cruvelhier*, Anatomie Pathologique, fol. Part VII. plate 6, Maladies de la peau (productions cornées), fig. 2 and 2[1], have a very near resemblance to those just mentioned, but at present no account is given of them. T.]

(6) *Musæus* D. de unguibus monstrosis. Hafn. 1716, with fig.—*Locke* in Philos. Transact. No. 230.—*Haskell* in New England Journ. of Medicine and Surgery, Vol. VIII. No. 1. Boston, 1819.—*Ash* Phil. Transact. No. 176.—*Behrends* and *W. Soemmerring*, pl. 2—4.

(7) In wild animals which are confined, I have several times observed elongation and deformity of the claws—in dogs it is sometimes the cause of lameness. v. *Blaine* On the Diseases of Dogs.—In oxen I have seen it several times; a short time since I possessed two ox feet, in which the hooflets were four inches long, and completely cylindrical;—in the horse there is very frequently malformation of the hoof, as flat-hoof, bound-hoof, brittle-hoof, pomet-foot, ass-hoof, &c.; in domestic birds the monstrous elongation of the claws is very common.

(8) Compare especially *Roger Collard.*

(9) The monsters, No. 2906 and 2917, of the Bresl. Mus. exhibit such nails, the latter a common nail for the fingers of the right hand; cases of this kind were also noticed by *v. Walther* Ueber die angebornen Fetthautgeschwül-ste und andre Bildungsfehler, p. 31. fol. Landshut, 1814. I saw a consolidation of the four outer nails of both hands of a remarkable thief in the Anatomical Museum at Freyburg. Something similar occurs in the undivided hoofs of pigs, v. *Otto* Selt. Beob. Part II. p. 83. I have since procured the skeleton of a pig of this kind for the Museum, No. 4652, and saw in the Veterinary School at Stockholm, three full-grown swine with the same deformity.

(10) *Blech*, fig. 5 and 6.

(11) *Ib.* fig. 1 and 2.

(12) *Schmidt* Diss. de leprosa, unguibus monstrosis prædita. Ultraj. 1696.

§ 98.

The COLOUR of the nails is not unfrequently irregular, thus in many diseases they lose their gloss, reddish colour, and natural transparency; or WHITE STREAKS, *seline*, are produced in consequence of partial or deficient nourishment; they even become entirely WHITE, which has been once observed in a paralytic person;[1] sometimes the normal white streak, *lunula*, is deficient; in jaundice they assume a YELLOW colour; sometimes yellow and red streaks are produced, as in the hoof of a horse affected with the so-called CORNS; they appear DUSKY and BLUISH in the blue disease, in suffocation, after bruises, in which blood is collected beneath them; they have been seen BLACKISH in some diseases.[2] The nails are also easily coloured either accidentally or purposely in various ways, for instance, yellow, brown, and even black, in baths containing iron and sulphur,[3] reddish in baths of red madder; in dyers, tanners, hat-makers, they are often deeply coloured, and many nations have the custom of colouring their nails.[4]

(1) *Loder* Medic. chir. Beobactungen, Vol. I. 8vo. Weimer, 1794.

(2) *Bartholinus* Acta Hafn. I. Obs. 32.—*Jackson.*—*d'Outrepont* in Reil's Archiv f. d. Physiol. Vol. IV. p. 472.—I have also seen it so twice in typhus fever.

(3) *Waitz* in *Hufeland's* Journ. d. prakt. Heilk. Vol. XVI. Part II. p. 22.

(4) For instance, in the east, red with the *Lawsonia inermis.*

§ 99.

We frequently find the CONSISTENCE and TEXTURE of the nails morbidly changed, either alone or generally together with similar changes in the cuticle. Spots, *lepra*, syphilis, gout,

polish plait, *tabes*, as well as the handling of sharp instruments by handicraft men, operate on them most frequently and prejudicially; we also observe them diseased in insane people.[1] The substance of the nail itself is sometimes SOFTENED, LOOSENED, SOAKED IN BLOOD,[2] more frequently it is very DRY, ROUGH, and HARSH, SPLITS,[3] and scales off in plates. The nails not unfrequently dry up, and are thrown off either alone, or together with the skin. Often also are they changed more or less by ulceration of the soft substance lying beneath and around them, are covered with proud flesh, *pterygium unguium*, and are partially separated or completely thrown off; this is especially the case in WHITLOE or FELON, *panaritium*,[4] in the so-called CANKER OF THE SOLE in horses,[5] and in the sporadic and epizootic DISEASES OF THE CLAWS. Finally, we observe many variations in reference to the FAVOURABLE REPRODUCTIVE POWER of the nails; thus it produces in sharp wounds, divisions of the hoof, &c. puffy SCARS projecting much externally or even internally; or if the nails have entirely been shed, they are either not reproduced or indeed only on foreign parts; for instance, after partial or complete loss of the finger, they are reproduced on the second or first joint, and even on the fore extremity of the metacarpus;[6] on the latter part they have been observed also as vices of structure in imperfect fingers,[7] as well also as congenital on the inside of the forefinger.[8]

(1) *Blech* gives an engraving of it, fig. 3 and 4.

(2) This at least is the case with the hoof of the horse in corns; perhaps also the case in the human subject given by *Nees* in *Hufeland's* Journ. d. prakt. Heilk. Vol. XVI. Part II. p. 183, belongs here.

(3) Not very unfrequent on the hoofs of horses and oxen, and in the former known by the name of cracked hoof, sandcrack, cleft hoof, broken hoof, &c. Compare *Schwab* Materialien zu einer pathologischen Anatomie der Hausthiere. 1st Part, p. 26. 8vo. München, 1815. The sandcrack arises usually mechanically from false quittor, whereby the hoof is entirely thrown off at the coronet.

(4) Called also *Panaris, Onychia, Paronychia. Acrel* in Svenska Vetensk. Acad. Handl. A. 1754, p. 271.—*van Amstel* D. de paronychia. Lugd. Bat. 1758.—*Sue* D. de panaritio. Paris, 1772; and in Mémoir. de la Soc. médicale d'émulation, Vol. II. p. 284.—*Focke* D. de paronychia. Gött. 1786.—*Melchior* D. de panaritio. Duisb. 1789.—*Flajani* Osservazioni pratiche sopra—il panereccio. Roma, 1791.—*Eggel* D. de panaritio. Erfurt, 1792.—*Barfoth* D. de panaritio. Lund. 1800.—*Vogt* D. de paronychia. Viteb. 1803.—*Cyvoet* D. sur le Panaris. Paris, 1807.—*Wardrop.*

(5) To abscesses of the nails belong also the quittor and thrush of veterinary physicians.

(6) *Pechlin* Observat. L. II. Obs. 42. — *Tulpius* Observat. medic. L. IV. c. LVI. p. 370.—*Voigtel* Handb. der pathol. Anatomie, Vol. I. p. 86.—*Marechal de Rougeres* in Journ. de Médec. Vol. XXVII. p. 177.—*Ormancey* in Journ. de Médec. continué, Vol. XVII. p. 218.

(7) *Bartholinus* Hist. anat. Vol. I. p. 241.

(8) *Ib.* 240.

THIRD CHAPTER.

Of Hair[1] *and Feathers.*

§ 100.

The formation of hair and feathers is not unfrequently seen DEFICIENT, in consequence of general weakness of the body, or of a certain peculiarity of race; here belong ENTIRE DEFICIENCY of these parts, which has been observed as a congenital formation in man,[2] and animals;[3] mere LOCAL DEFICIENCY,[4] RETARDED PUTTING FORTH OF THE HAIR, either generally or locally, and finally, the TOO SPARING GROWTH OF THE HAIR.[5] More commonly are the hairs deficient generally or locally, when, as is the fashion with many people, they have been carefully pulled out and removed by aquafortis, or have fallen out from disease;[6] the latter is very common on the head, and is even hereditary[7] and endemic.[8] The opposite vice also, viz. EXCESS IN THE FORMATION OF HAIR AND FEATHERS, not unfrequently occurs, in so far as the growth of hair on the whole body, or only on certain parts[9] is too great; it is also observed on very unusual situations,[10] or uncommonly early,[11] and even in advanced age.[12]

(1) *Joubert* De affectibus pilorum et cutis, præsertim capitis. 8vo. Lyon, 1577. —*Ampsing* Hortus adfectionum capillos et pilos corp. hum. infestantium. 4to. Rostock, 1623.—*Fort. Plempius* De affectibus capillorum et unguium. Lovan. 1661.—*Meibom* D. de pilis eorumque morbis. Helmst. 1704.—*Salwick* D. de morbis pilorum. Frib. 1777.—*Pfaff* D. de varietatibus pilorum naturalibus et præternaturalibus. 4to. Halæ. 1799.—*Wolfart* Bemerk. über die krankhafte Veränderung der Haare, in Asklepieion, 1811, No. 41, p. 674.— *Wedemeyer* Com. historiam pathologicam pilorum corporis humani sistens. 4to. Götting. 1812.—*van der Burch* D. de integumentis communibus, pilis ac pilorum varietatibus. L. B. 1814.—*Meckel* Ueber regelwidrige Haar-und Zahnbildungen, in Archiv für die Physiologie, Vol. I. p. 519.—*Ægidi* D. de pilorum anatomia, physiologia, pathologia et therapia. 8vo. Berol. 1819. — *Buck* D. de pilis eorumque morbis. 8vo. Halæ, 1819.—*Bergmann* die Krankheiten der Haut, der Haare und Nägel. 8vo. Leipz. 1824.—*Benvenuti* De naturali et morbosa pilorum œconomia. 8vo. Patav. 1825.—*Vogel* Von der diagnostischen Würde der Haare, in *Hecker's* literar. Annalen der ges Heilkunde, 1825, Novbr. u. Decbr.—*Blümmener* Adhandlung über das menschliche Haupthaar, in histor. anatom. physiol. pathologisch und therapeut. Hinsicht. 8vo. Berlin, 1826.

(2) *Heister* in Ephem. Acad. N. Cur. Cent. I. and II. p. 431.—*Danz* in *Stark's* Archiv f. d. Geburtshülfe, Vol. IV. p. 684, in two adult Jews who never had teeth. — *Augustin* in *Wolfart's* Asklepieion, 1812, März, p. 281. — *Wells* in Transact. of the Soc. med. and chir. knowledge, Vol. II. p. 264. [In 1811 there was a man, aged twenty years, employed at the Courier newspaper office, London, who had not any hair upon the head, eyebrows, eyelids, nor chin, and was said to have had none on the pubes. T.]

(3) For instance, the known races of horses and dogs without hair; a rabbit, v. Allg. Hist der Natur. Part VII. Vol. II. p. 238. No. 1415; a cat, *Guettard* Mémoires. Vol. II. p. 17.—I also once possessed a full grown goat, entirely bare

from birth; it also occurs in birds. I knew, for instance, a kind of doves entirely featherless, which so continued to be produced through many generations. — *Otto* Verzeichn. d. anat. Präparatensammlung, No. 2132. — *Schleep* describes an unfledged canary bird in the N. Annalen der Wetterauischen Gesellschaft, Vol. I. Part I. p. 180.

(4) For example, bare spots in the beard; in one case also on the head in the region of the fontanel. v. Misc. N. Cur. Dec. I. Ann. VI. Obs. 74.

(5) For example, in weakly persons, in eunuchs.

(6) *Pilorum defluvium, Alopecia, Madarosis, Calvities*, upon the head also called *Area, Ovum* and *Ophiasis*, is the consequence of great weakness, therefore also of many acute and chronic diseases, of lying-in, of grief, of fear, of many exanthematous diseases, especially the itch, of poisoning by arsenic, &c.; in animals also, falling off of the hair occurs; viz. among domestic animals, especially in horses, sheep, and swine. I observed it also in a stag which I still possess; it is common in parrots, and other domesticated birds.

(7) *Mangili* sulla calvezza ereditaria, in Giorn. della Soc. med. chir. di Parma. Vol. VIII. p. 57.

(8) In Barbary, according to *Leo Africanus* Descriptio Africæ, Lib. I. p. 85.

(9) For example, in the beard of sterile women; compare *Hippocrates* Επιδημιων, Lib. VI. Sect. VIII. — *Haller* Elem. Physiol. Vol. V. p. 32.—*de Plouquet* Repertor. Barba mulierum.—*Reuss* Repert. Comment. Vol. X. p. 205. —Curiositäten der phys. liter. artist. histor. Vor-und Mitwelt. Vol. I. Part I. Weimar, 1811.—I have myself seen many, both alive and in engravings. Too great length of hair of the head, so that it reaches the ground, *Brückmann* in *Horn's* Archiv für medic. Erfahrung, 1811, Vol. II. p. 69; the pubic hair in a woman an ell and a half long; v. Collect. Acad. Vol. III. p. 168; a monstrously long tail in a horse in the Royal Cabinet of Natural History at Dresden; frequently very long manes in horses; monstrous strange feathers in many kinds of domestic birds; individual very long feathers in birds, &c.

(10) In anencephalous monsters, the hair of the head descends to the eyebrows and root of the nose, and if the spine be, at the same time, cleft, also along its edges; stiff hairs on the upper end of acephalous monsters; upon the navel, *Osiander* Denkwürdigkeiten a. d. Geburtshülfe, Vol. II. Part II. p. 406; a hairy stripe upon the back, *Gilibert* Samml. prakt. Beobact. übers. v. *Hebenstreit*, Leipz. 1772, p. 56; especially on warts and mothers' marks, viz. *Rosenmüller* in his and *Isenflamm's* Beitr. f. d. Zergliederungskunst, Vol. II. No. 1. p. 106, pl. 2, fig. 2, upon almost the whole back, besides many other examples; from the breast and shoulders down to the knees, *Ruggieri* Storia ragionata di una Donna, avente gran parte del corpo coperta di pile et pelle nero. 8vo. Venez. 1815; with which are also several other instances; *v. Walther* Ueber die angebornen Fetthautgeschwülste, u. s. w. fol. Landshut, 1814, pl. 1 and 2; upon hair in encysted tumours, compare § 64, note 9; upon hair in the other internal parts, the same.

(11) Compare § 20, note 4; in a girl four years and nine months old, there were strong pubic hairs, *Cookson* in Medic. and Phys. Journ. *Sédillot* Journ. géner. de Médec. Vol. XLVII. p. 101.

(12) *Schurich* De calvo post triginta annorum decursum comato. Misc. Acad. N. Cur. Dec. III. Ann. 7 and 8, p. 191.—Observations sur des cheveux et deux dents revenus à un homme de 70 ans, in Mém. de Paris. An. 1703. Hist. p. 37.

§ 101.

Sometimes also the FORM of the hair varies; thus we notice it irregularly thin and fine, for instance, as a kind of *lanugo* on the skin in adult albinoes; but it is more frequently too thick and stiff; it is often found unequally thick, thus in different places thinner and thicker, here and there knotted, when broken, for instance on the hands, on the parts of hernia,

&c.; human hairs are sometimes cleft at the end like bristles, *dicophyia.* Animals which have the hair otherwise smooth, present it, as an exception, curled;[1] we also find the direction of the hair and feathers irregular in other respects, for instance, in *trichiasis* of the eye-lashes, on the head taking unusual turns; certain feathers twisted, &c. Feathers are produced without barbs, especially in one variety of fowls; on the contrary, there are also double hairs and feathers, sometimes two or several spring out of a single root;[2] the feathers of very old female birds even assume the form of those of the male, &c.[3]

(1) A horse with curly hair is engraved in *Geoffroy* and *F. Cuvier's* Mammifères, Liv. 32. I saw three horses in the Cabinet of Natural History, in the University and in the Veterinary School at Vienna, with all the hair curly; in a peculiar kind of fowl, the feathers are not unfrequently seen crisped and bent up; I knew a lady, who lost her long smooth hair, which became short and curly; the hair sometimes crisps only during disease, viz. under an attack of gout in the head. v. American Medical Recorder, p. 277.

(2) I have myself noticed such hair; I have also seen a double feather from a goose and from a partridge. v. *Otto* Verzeichniss d. anat. Präparatensamml. No. 6069.—*Hanow* also saw a double wing feather in a goose. v. his Seltenheiten der Natur. Vol. III. p. 114; in many birds remarkable double feathers belong to their natural structure.

(3) For instance, the long band-like feathers of the cock; old hens of the *Meleagris Gallopavo* sometimes have a hairy tuft on the breast like the males. v. *Bechstein* Naturgeschichte Deutschl. Vol. III. p. 116.

§ 102.

The COLOUR of the hair and feathers is still more frequently irregular; this is not uncommonly observed as a CONGENITAL or ORIGINAL, and even as an HEREDITARY STATE; to it belongs the unusually LIGHT or ENTIRE WHITE COLOUR of hair and feathers which we observe, especially, in albinoes among men and animals, although also without this known vice in the eyes.[1] Sometimes the colour of hair and feathers is only white at certain parts, and the body merely spotted.[2] We also notice other various colours,[3] as well as the remarkable variation of the colour of the hair in man on various parts of the body. The change of colour in hair and feathers is more frequently ACQUIRED and produced in later years from disease, food, old age; here is to be observed the bleaching of the hair, and its greyness, *canities*, which occurs in later age, and also earlier under weakening influences, even in rare cases is sudden, sometimes also only local;[4] we see besides, though rarely, the outer half of the hair become white, whilst that nearest the root remains black.[5] Much more seldom is the deepening of the colour of the hair and feathers which we have however seen in man[6] and animals.[7] We observe also other colours; thus, for example, in a woman with blond hair, so often as she

had fever it became reddish.[8] Parrots, it is said, in a diseased state, become not white but yellow; also the same colour still remaining, different shades in it are produced.[9] We have frequently seen hen birds assume in old age the colour and form of the plumage of the male.[10] Finally, it is known, that the hair can either accidentally or purposely[11] be rendered black, violet, blue, and green, by various pigments.

(1) Several instances are mentioned of men born with grey hairs; I myself knew a young man, who from his birth had so much white beneath his black hair, that it appeared grey; among mammalia the white colour has been seen as an irregularity in the ape, shrew, mole, marten, (of both the latter there are instances in the Bresl. Mus. of Natural History,) polecat, seal, fox, rat, the several kinds of mice, the squirrel, hare, elephant, horse, camel, stag, fallow deer, and buffalo; among birds we often see white ravens and crows, (one such I possessed alive for a long time,) sparrows, larks, finches, linnets, buntings, swallows, &c.; a white *Corvus Cornix* and *Monedula*, *Garrulus glandarius*, *Ampelis garrulus*, *Turdus iliacus*, *pilaris* and *musicus*, *Hirundo rustica*, three examples, *Alauda arvensis*, *Motacilla flava*, *Fringilla domestica* and *montana*, exist in Bresl. Zoological Museum; many instances have been collected by *Tiedemann* in his Zoologie, Vol. III. p. 304. Compare *Günther's* Gedanken über die ganz weissen Vögel, welche von anders gefärbten Eltern anatomisch erzeugt werden, im Naturforscher, Part I. p. 54.—*Zorn* Einwendungen gegen *Günther's* Hypothese, und *Walch* von der anomalischen weissen Farbe der Vögel, *ib.* Part IV. p. 128 and 135.—A white song-thrush and a similar cross-bill are described in *Meyer's* Zeitschrift für das Forst-und Jagdwesen in Baiern. 2ter Jahrg. München, 1814.

(2) For instance, stags with a white spot, v. *Wildungen* Taschenbuch f. Forst- und Jagdfreunde f. die Jahre, 1809—1812, Marburg, with an engraving. I saw a similar stag, and one with a much larger white spot on the neck, in the Royal Saxon Zoological Garden at Moritzburgh; a white-thighed roebuck, v. *Gatterer* and *Laurop*, Annalen der Forst- und Jagdwissenchaft, Darmstadt, 1811. 1st vol. White spots on birds are not uncommon; in Bresl. Mus. a crow and a song-thrush exhibit them.

(3) Red hair in dark nations, fox-red elephants, a light bay-coloured marten, and an iron-grey roebuck, in Bresl. Mus.

(4) For instance, only on one side of the head. I knew a young officer, in the midst of whose black hair was one completely white lock; in horses, several white spots, from pressure of the harness, are very common; black fowls, when very old, have often white spots. v. *Schröter* in den Berlin, Mannigfaltigkeiten, Jahrg. II. p. 168.

(5) *Destrés* in Journ. génér. de Médec. Vol. LXIX. p. 213, Nov. 1819.—*de Plouquet* Repertor. Art. Capillorum Denigratio.

(6) *Bruley* in *Sédilot* Rec. période. de la Soc. de Santé de Paris, Vol. IV. p. 290.—*J. Sinclair*, The code of health and longevity, 4 vols. 8vo. Edinb. 1807. Instead of falling out, light hair will become dark, as I have myself noticed. v. Dict. des Sciences Médicales, Vol. IV. p. 17.

(7) For instance, stags becoming black, v. *Sylvan*, etc. von *Laurop* and *Fischer*. No. 5. Marburg, 1813.—I saw a completely black mus arvalis, in the museum of Professor *Schinz*, at Zurich. Birds which are confined, as bulfinches, cross-bills, goldfinches, often become darker. Compare *Günther*, Gedanken über die Entstehung der anomalischen schwarzen Farbe verschiedner sonst anders gefärbter Vögel im Naturforscher, Vol. II. p. 1. [Larks in confinement, fed upon hempseed, will become black, as also other birds. T.]

(8) *Isouard* in Journ. compl. du Dict. des Sc. médic. Vol. V. p. 39; in one other instance, instead of blond-hair falling off, it became red. v. Dict. des Sc. Médic. Vol. IV. p. 7.

(9) *Le Vaillant* v. *Rudolphi's* Bemerkungen auf einer Reise u. s. w. Part I.

p. 235; it is however said, that the little green parrot, from Surat, becomes quite white in old age. v. *Turpin*, Hist. de Siam, Vol. I. p. 321. I possess one, probably very old, *Psittacus dominicensis*, which was first bright red, then marked with dark red spots, and at last almost entirely of a deep purple colour; but the tips of the wings remained bluish-green. In Bresl. Mus. there is a wild *Anas boschus*, of which the whole under parts have a beautiful purple-coloured plumage.

(10) *J. Hunter*, in Phil. Trans. Vol. LXX. p. 527; and in his Obs. on certain parts of the Animal Economy, p. 75. 4to. 2d edit. London, 1792.—*Blumenbach*, in his Institut. Physiol. p. 550; and in De anomalis et vitiosis quibusdam nisus formativi aberrationibus Commentatio. 4to. Gött. 1813.—*Tiedemann* Zoologie, Vol. III. p. 306.—*Kob* D. de mutatione sexus. p. 11. 8vo. Berol. 1823.—*Butler*, in Memoirs of the Wernerian Nat. Hist. Soc. Vol. III. p. 188.—*Isid. Geoffroy-Saint-Hillaire* in Mémoires du Museum, Vol. XII. p. 220, and in Annales des Sc. Naturelles, Vol. VII. p. 336, March, 1826. This has been also observed in the *Phasianus colchicus*, *nycthemerus*, *pictus* and *gallus*, in the *Meleagris Gallopavo*, *Tetrao Perdrix*, *Columba*, *Otis tarda*, *Platalea*, *Anas*, in the *Ampelides*, in some species of *Fringilla*, *Motacilla erythacus*, and in *Sturnus vulgaris*.

(11) In persons of light hair, who work in metal, it is found green and blue.

§ 103.

The vices of CONSISTENCE and STRUCTURE are, as might be expected from the simple structure of the hair, but few. To these belong first, the irregular DRYNESS and STIFFNESS of the hair, which arise indeed from a diminution in the quantity of the fatty and lymph-like moisture contained in it, and run on either to the dryness and shedding of the hair already mentioned, or to splitting and breaking;[1] then the opposite vice, or SOFTENING, LOOSENING, VERY GREAT MOISTURE, and ACTIVITY OF SECRETION in the hairs and feathers.[2] We observe these frequently in scald head, *tinea*, in the rot in pigs, and especially in POLISH PLAIT, *plica polonica*, *trichoma*, *cirrhagra*,[3] &c. The latter disease occurs spontaneously, but is endemic and even hereditary in Poland, and consists of a peculiar entangling and matting of the hairs, which are swollen at their roots and are more or less soft, and secrete a kind of viscous lymph, by which the hair of the head, the beard, or hair of the pubes, forms various cap-like or plaited masses. The same disease occurs also in animals.[4]

(1) *E. H. Weber* in *Meekel's* Archiv f. Anat. und Phys. 1827, No. 11, p. 222.

(2) In many diseases of the horse, oxen, and sheep, we find the hair too soft. v. Vollst. Handb. der Vieharzneikunst von *Chabert*, *Flandrin*, and *Huzard*. Vol. II. p. 186. Berlin, 1801.

(3) v. the writers in *de Plouquet* Repertor. and *Reuss* Repert. Comment. Art. Plica polonica; the most important and recent cases, in *Haller* Disp. med. pract. Vol. I.—*Vicat* Mém. sur la Plique polonaise. Lausan. 1775.—*de la Fontaine* Chir. med. Abhandl. 8vo. Breslau, 1792, with seven plates.—*Berends* D. de dubio plicæ polonicæ inter morbos loco. Francof. 1801.—*Wolfram* Versuch über die höchst wahrscheinl. Ursachen des Weichselzopfes. 8vo. Breslau, 1804.—*J. F. A. Schlegel* Ueber die Ursachen des Weichselzopfes der Menschen und Thiere. 8vo. Jena, 1806, with engravings; and in Materialien f. die Staatsarzneiwissenschaft, Vol. VI.; and in Neuen Materialien u. s. w. Vol. II. No. 22, with drawings.—*Walter* D. de pl. p. Marb. 1808.—*Gembitzki* D. de singulari pilorum vegetatione morbosa, etc. Erfurt, 1808.—*Chromy* Neuste Wahrneh-

mungen über die Krankheit des Weichselzopfes u. s. w. 8vo. Krakau, 1809.—*v. Ruhmfeld* Neuste Geschichte des Weichselzopfes. 8vo. Freiberg, 1813.—*J. Frank*, Mémoirs sur l'origine et la nature de la plique polonaise. Vilna, 1814.—*Hecker* Gedanken über die Natur u. Ursachen des Weichselzopfes. 8vo. Gotha, 1819.—*Szklarski* D. de trichomate. 8vo. Berol. 1823. — *Goullon* D. de plica polonica. 8vo. Berol. 1824.—*v. Steinköhl* der Weichselzopf in Deutschland. 4to. Hadamar, 1824, with one plate.—*J. Schlesinger* D. de trichomate. 8vo. Berol. 1827. — Compare also *Larrey's* Med. chir. Denkwürdigkeiten, and *Alibert* Maladies de la Peau, p. 25—48, pl. 6—10.—*Leschenault de la Tour* on the Polish plait in India, in Mémoires du Muséum d'hist. nat. Vol. IX. p. 245.—[Article Trichoma in Dict. des Sciences Médic.—*de Carro* on Plica polonica in Med. chir. Rev. Vol. XIII. p. xxx.—*Defour*, Case of plica polonica, in Lond. Med and Phys. Journ. Vol. XVI. p. 235. T.] The opinions held by the ancients concerning the blood contained in the hair, in plica polonica, has been treated of lately by *Henning*, v. *Horn's* Archiv f. medic. Erfahr. Sept. and Oct. 1823, p. 201. Many cases of plica are found in Bresl. Mus. v. *Otto* Verzeichn. No. 3998—4013. Even the chemical composition of the hair is so changed in this disease, that it dissolves in boiling.

(4) For instance, in horses in North Germany. *Greve* Erfahr. u. Beobachtungen über die Krankheiten der Hausthiere u. s. w. p. 112. Oldenberg, 1818; in oxen, dogs, and foxes.

FIFTEENTH SECTION.

Of the Bony System.

FIRST CHAPTER.

Of Bones in General.[1]

§ 104.

The FORMATION AND PERFECTION OF THE BONY SYSTEM, in man and animals, is subject to various INTERRUPTIONS both as to time and degree, sometimes accompanied with imperfect development of the whole organism, sometimes merely with that of the skeleton alone. In rare cases, not the least trace of bone[2] has been found in monsters; more commonly the deposition of lime in the cartilaginous nidus of the skeleton is, alone, either entirely or partially deficient, and the latter therefore in a high degree imperfect; this is most generally the case in congenital rickets;[3] although also after birth the perfection of the bones is sometimes very much disturbed by debility, disease and pressure;[4] so that for instance, at the period of manhood, the skeleton is still that of a child, and the epiphyses still remain unattached to the bodies of the bones;[5] the sessamoid bones continue cartilaginous, &c.

(1) Compare *de Plouquet* Repertor. Art. Os. — *Courtial et Petit* Description exacte des Os. etc. 12mo. Paris, Leyde, 1709.—*Herissant* in Mém. de Paris. A. 1758. Mém. p. 419. — *Boerhaave* Abhandl. vom Krebs und Krankheiten der Knochen. Fr. 1765.—*Schaarschmidt's* Kurzur Unterricht von den Krankheiten der Knochen. 8vo. Berlin, 1768.—*Vicq-d'Azyr* in Hist. et Mém. de la Soc. R. de Médec. A. 1779. Hist. p. 224.—*Böttcher* Abhand. von den Krankheiten der Knochen, Knorpel und Sehnen. 8vo. Dessau u. Könings. 1781–93. 3 parts, and Königs. 1795. — *A. Bonn* Descriptio thesauri ossium morbosorum Hoviani. 4to. Amstel. 1783.—*Bertrandi* Ueber die Knochenkrankheiten, a. d. Ital. von *Spohr*. 8vo. Leips. u. Dresd. 1792. — *Clossius* Ueber die Krankheiten der Knochen. 8vo. Tubingen, 1798.—*V. Malacarne* Auctuar. observationum et iconum ad osteologiam et osteopathologiam *Ludvigii* et *Scarpæ*. Patavii, 1801.—(*van Heckerens* und *Dyl's*) Vermischte Beiträge zur Beförderung der Kenntniss und Behandlung der Knochenkrankheiten. Part II. 8vo. Bresl. 1803.—*Boyer* Leçons sur les maladies des os. 2 vols. 8vo. Paris, 1803, translated by *M. Farrel*, 2 vols. 8vo. London, 1807.—*Vidler* in *Wolfart's* Asklepieion, June, 1812. — *J. Howship*, in Medio-chirurgical Tranactions, 1817, Vol. VIII. Part I. p. 57—107. — *Rodati* in Præparationes osseas musei pathologici animadversiones in Opuscul. scientif. Fasc. XII. p. 362. Bologna, 1818.—*Ribes* in Bull. de la Facul. de Médec. Vol. VI. p. 299. Compare *Meckel's* D. Archiv f. d. Physiol. Vol. VI. p. 446.—*Jam. Wilson*, Lectures on the Struct. and Physiol. of the parts composing the Skeleton, and on the Diseases of the Bones and Joints. 8vo. London, 1820. — *Caspari* Physiol. pathol. Abhandl. über die Entstehung der Knockenkrankheiten in *v. Graefe's* and *v. Walther's* Journ. f. Chir. u. Augenhk. Vol. V. Part I. p. 44. — *v. Walther* Ueber Krankheiten fossiler Thierknochen, Vol. VIII. Part I. p. 1—16.—*Cumin*, in Edinb. med. and surgic. Journ. No. 82, Jan. 1825.—Good plates of diseased bones are given by *Cheselden*, Osteographia, or anatomy of the bones. fol. London, 1733.—*Bonn* Tabulæ ossium morbosorum. fol. Fasc. I—III. Amstel. 1785–88.—*Ed. Sandifort*, Museum anat. Vol. II. tab. 1—103. — *Ludwigii* Icones anatom. pathol. Lips. 1798, tab. 3—14, &c. [*C. Havers*, Osteologia Nova, or some new observations of the bones and the parts belonging to them. 8vo. London, 1691. — *Hernauld*, Dissertation sur les maladies des os. 12mo. Paris, 1726.—*G. Bribosia*, De morbis ossium. Givot. 1777. — *Walker*, Cases and remarks relative to diseases of the bones, in Med. Trans. of Coll. of Phys. Vol. III. p. 25.—A Fasciculus, containing nine lithographic anatomical drawings, from preparations in the Museum of the Medical Department at Chatham. fol. London, 1824. T.]

(2) In a monstrous calf, *Camper* Abhandl. von den Krankheiten, die sowohl den Menschen als Thieren eigen sind u. s. w. 2d edit. p. 23, note.—*Blandin* Philos. Transact. 1787, Vol. LXXI. Part I. p. 363.—*G. Vrolick* Verhandeling over de zonderlige Misvorming eener Vrucht, u. s. w.; and Mémoires sur quélques interessants d'Anatomie et de Physiologie. trad. par *Fallot*. 4to. Amsterd. 1822.

(3) *Glisson*, De rhachitide, etc. London, 1650.—*Bidloo* Opera omnia, p. 191.—*Klein* D. s. casum rhachitidis congenitæ, etc. 4to. Strasb. 1763; and in Nov. Actis N. Cur. Vol. I. p. 146.—*Pinel* in la Medecine éclairée par les Sc. physiques, Vol. I. p. 111.—*Bordenave* in Mém de Mathem. et de Phys. Vol. IV. p. 545.—*Soemmerring* Abbildungen und Beschreib. einiger Missgeburten. p. 30, plate 11.—*Henke* Neue medic. chir. Anmerkungen. Part II. p. 58. Berlin, 1772.—*Otto* Selt. Beob. Part I. p. 1, pl. 1, fig. 1.—Verzeichniss der anat. Präparatensammlung, No. 2905 and 3012.—*Romberg* D. de rhachitide congenita. Berol. 1817, with engravings.—*J. F. Meckel* Anat. physiol. Beobacht. u. Untersuchungen. p. 1. Halle, 1822.—*Rathke* in *Meckel's* D. Archiv, Vol. VII. p. 484.—*Sartorius* Rhachitidis congenitæ Observationes. 4to. Lips. 1826, with three engravings.—*v. Loder* Index Præparatorum, etc. Mosquæ, 1823. 8vo. Sect. II. D.—I saw a similar fœtus in the Anat. Museum at Strasburg, at *Naegele's* in Heidelberg and at *v. Soemmerring's;* I have also seen this disease several times in new-born calves; v. *Herzberg* D. Monstri vitulini descriptio anatomica. 4to. Berol. 1825, with engravings.

(4) Especially in dropsy of the head.

(5) In a man of twenty-five years old. See *Rudolphi* Bemerkungen auf einer

reise, u.s.w. Part I. p. 140, which case I also saw with Dr. *de Reimer* at the Hague. I have also observed in some men of twenty-two, and in one of twenty-three years, the separation of all the epiphyses, and the same also in the skeleton of a man of twenty-seven years, in the hospital St. Francisci at Naples.

§ 105.

The opposite vice also, viz. the TOO GREAT ACTIVITY IN REFERENCE TO THE FORMATION OF BONE, *hyperostosis*, occurs, though much more rarely, and in like manner sometimes as to time alone, sometimes as to degree. To the former kind belongs the premature perfection and hardening of all or only of some bones, so that, for example, the bones of a newly born child are too full of lime, and therefore very frangible; further, the very early closing of the fontanels, the consolidation of the bones of the skull, of the two halves of the lower jaw and of the epiphyses, at a much too early period; the very early cutting of the teeth, &c. In the latter kind we must include the possible excessive production of bony matter which may occur at any period of life, and in rare cases is exhibited throughout almost the whole skeleton, but more frequently is only local, and consists in the morbid thickening, enlargement or growth of the bones. We also often observe, that the earth of the bones taken up from some diseased parts of the skeleton, is deposited more freely on other parts.

§ 106.

The NUMBER of the bones forming the skeleton is not unfrequently subject to VARIATION, which, if we exclude the mechanical or morbid separation of individual bones, is always naturally ORIGINAL. It is to be recollected that in deficient or excessive formation of single parts, their bones are deficient or supernumerary; but even in the external apparently normal formation of a part, the number of bones sometimes varies, thus some are DEFICIENT or SUPERFLUOUS;[1] this most frequently appears to be the case with reference to the teeth, the vertebræ, and the ribs; the number of the sesamoid bones[2] also varies uncommonly, as they are often entirely or partially wanting; in rare cases there are two or three to one joint, or they are also found in entirely unusual situations.[3] The number of the bones is apparently not less increased by the permanent separation of the single pieces of a bone, and by the sutural and interstitial bones.[4]

(1) Compare further below the separate bones.

(2) *J. Fr. Crell* de ossibus sesamoideis. Helmst. 1746.—*Bertin* Traité d'ostéologie, Vol. IV. p. 231.—*Haller* Element. Physiol. Vol. IV. p. 500.—*Blumenbach* Osteologie.

(3) For instance, on the outer four fingers and toes, on the front joints of the fingers and toes, on the articular processes of the thigh bone, on the wrist, the spine, the forehead. v. *Burchard* D. de peculiari osse sesamoideo ad os frontale reperto, 4to. Rostock, 1742, on the elbow joint. v. *Chenal* Observ. botanicæ, § 28. 4to. Basil, 1766; and *Soemmerring* Vom Bau des menschl. Körpers. Vol. I. p. 425, &c.

(4) See further on.

§ 107.

The SIZE of bones is subject to various deviations from the general law. Only in DWARFS[1] and GIANTS,[2] is the NORMAL MASS OF THE WHOLE SKELETON changed: a vice which otherwise occurs merely in reference to SINGLE BONES or INDIVIDUAL REGIONS OF THE SKELETON, may be CONGENITAL as well as ACQUIRED, and not unfrequently produces great disproportion and want of symmetry in the skeleton. The frequency of such vices is not to be wondered at, as the bones, in spite of their hardness, are of all organs the most changeable. The TOO SMALL SIZE of single bones is frequently CONGENITAL; thus, for instance, we find in malformed children, the skull, the face, the chest, the limbs too small, and the latter even only on one side,[3] &c. Individual parts of the skeleton frequently remain undeveloped[4] from different causes DURING YOUTH; lastly, well-formed bones may in LATER LIFE distinctly diminish in size, which is called CONSUMPTION OF BONE, *tabes ossium*;[5] a phenomenon produced by disturbed nutrition, and the contractile power which belongs to bones. Sometimes we observe this consumption in the bones of whole limbs after lameness, dislocations, &c.; it is more commonly local, especially from long continued pressure;[6] so that in the latter case, without any erosion[7] of the bone, it diminishes at a particular spot, a pit is formed, and indeed in flat bones, it wastes even to the periosteum, and holes are produced. Here also belong the narrowing and diminution of the cavities and canals of bones which occur every where, and often in a very high degree, if the expansile power be lost or entirely consumed.[8] The opposite vice, or the IRREGULAR SIZE OF CERTAIN BONES OR REGIONS OF THE SKELETON, is, in monsters with disproportion of parts, sometimes CONGENITAL, so also when in original deficiency of individual bones, the neighbouring bones occupy their place;[9] more frequently it is ACQUIRED, and is then the consequence of hypertrophy in certain parts of the skeleton, of mechanical extension,[10] or lastly and most frequently of vice of texture, which increases either many bones at the same time or only single ones, and thus produces BONY TUMOURS, *tumores ossium*.[11] This morbid enlargement has generally reference only to the breadth and thickness of a bone, but very rarely to

its longitudinal proportions.[12] On account of the strength of the bony tissue, it is very natural that morbid swellings in bones should be more permanent than in soft parts, and if they acquire a certain size, they are never again entirely lost.

(1) Skeletons of dwarfs are found in many collections.

(2) *Schoenberg* Ueber das Skelet des grossen Anton (now at Marburg) im Magazin der naturf. Freunde zu Berlin, 1810, Jahrg. IV. p. 236.—*Degg* in Phil. Transact. 1727, p. 363.—*Zitterland* D. de duorum sceletorum prægrandium rationibus. 8vo. Berol. 1815.—The skeleton of the Irishman, Patrick O'Brien, in the Hunterian Museum at London, is seven feet eight inches and a half high, and his thigh bone is about as tall as the Polish dwarf Borulawski. Gigantic and dwarfish skeletons exhibit frequent disproportions of the several regions; this occurs also in animals, for example, in a dwarf horse. *Neergard* Beitr. zur vergl. Anat., Thierarzneikunde und Naturgeschichte, p. 28, pl. 1. Gött. 1807.

(3) I have observed this several times. Compare *Breschet* in Med. Trans. Vol. IX. 1818, p. 433.

(4) Compare several instances in the upper extremities: *Otto* Seltene Beobacht, Vol. II. p. 32, No. 11, on the lower extremities: *Lobstein* Compte rendu sur les travaux anatomiques pendant 1822-23, p. 30, 8vo. Strasb. 1824; the feet of the Chinese women, from long continued pressure, &c.

(5) *Lehmann* D. de Tabe ossium. 4to. Lips. 1821, with engravings.—*Sebastian* Ueber die Knochenscwindsucht, in *Hufeland's* Journ. p. 3, July, 1821.

(6) For instance, from tumours of all kinds, from the head of a dislocated bone, from water and hydatids in the skull, from external mechanical causes, &c.

(7) Of this further on.

(8) Thus, for instance, do the orbits, the alveolar cavities, the openings in the base of the skull, the articular cavities, and even the chest, become narrowed.

(9) For instance, the upper jaw, when the nasal and lachrymal bones are deficient; the parietal in deficient frontal bone.

(10) To wit, the bones of the skull from dropsy of the brain, the acetabulum, from enlargement of the head of the thigh bone, &c.

(11) *Roberg* D. de ossibus tuberosis. Upsal. 1717. v. *Haller* Coll. Disp. chir. IV. No. 122.—*Heister* D. de ossium tumoribus. Helmst. 1740.—*Matani* de osseis tumoribus. 8vo. Pisa, 1763.

(12) An instance of this kind occurring on the shin bone of a boy is known to me; compare *Trendelenburg* præs. *Florman* D. de longitudine femoris ancta, sine prævia luxatione. 4to. Lund. 1812, on the last joint of the finger.—*Portal* Cours d'Anatomie médicale, Vol. I. p. 14.

§ 108.

Not less common are the VICES OF FORM in bones,[1] which may be CONGENITAL as well as ACQUIRED. To these belong the various forms corresponding to the external contour of mishapen bodies which the bones so often present, for instance, in the anencephala, the cyclops, the monsters with clefts of the face, chest, and spine, with deformed extremities, with deficiency, excess, and consolidation of parts; then a great number of more minute variations of form in certain bones, not indicated by the general form of the body, which not unfrequently, like many of the foregoing, are RETARDED FORMATIONS; further, such deformities as arise from pernicious fashions and customs, for instance, pressure of the head, pressure from stays, small shoes, certain positions of the body; the vices of form caused

by tumours, dislocations, and badly united fractures; and lastly, especially the obliquity, contortion, and curvature of the skeleton, sometimes congenital, but more frequently produced by disease, which are remarkably frequent in the spine and extremities,[2] and are sometimes followed by very decided and general malformation of the body.[3]

(1) *E. Sandifort* De ossibus, diverso modo a solita conformatione abludentibus in Observ. anat. pathol. L. III. cap. 10, and L. IV. cap. 10. — *van Doeveren* observationes osteologicæ, varios naturæ lusus in ossibus humanor. corpor. exhib. in Observ. acad. specim. Lug. Bat. 1765.—*Rosenmüller* D. de singularibus et nativis ossium corp. hum. varietatibus. 4to. Lips. 1804, with engravings.—*Fesmer* præs. *Rudolphi* D. anat. seu Observationes osteologicæ. Berol. 1812, with two engravings.

(2) On the upper extremities however much more rare than on the lower.

(3) Good plates of such skeletons are given in *Sandifort* Museum anat. Vol. II. pl. 1—5. — *Rodati* in Opusc. scientif. Bologna. 1817. Fasc. V. pl. 11, 12.—*Copeland*, On the symptoms and treatment of diseased spine. 8vo. Lond. 1815.—Striking examples are given by *Vrolick* Mémoires sur quelques sujets intéressants d'anatomie et de physiologie. trad. du Hollandais par *Fallot*. 4to. Amsterd. 1822.—Compare *Otto* Verzeichniss der anat. Präparatensammlung, No. 3019—3025.

§ 109.

The irregular CONNEXION of bones with each other, and often their POSITION[1] also, is tolerably frequent; their connexion may be either in a slight degree or entirely destroyed, or it may be too firm; both occur in bones which are immovably and movably connected, and may be observed both as congenital and occurring at a later period of life. To the DIMINISHED CONNEXION belong the not unfrequent CONGENITAL CLEFTS of the face, spine, chest, and pelvis; the separation in youth, *osteodiastasis*,[2] of immovably connected bones, still, however continuing in adults, which is produced in the skull by water, effusion of blood, tumours, &c., in the face, especially by polyps, and sometimes in the pelvis by relaxation of the ligaments and extension from within; and lastly, the naturally more common DISLOCATION, *luxatio*,[3] in which the normally connected articular ends of two or more bones are, by mechanical extension or tearing of the ligaments, separated from each other, partially, *luxatio incompleta, subluxatio*, or entirely, *luxatio completa*. If dislocation arise from internal causes, as from swelling of the articular end of a bone or from other diseases of joints, this we call SPONTANEOUS DISLOCATION, *luxatio spontanea*;[4] in animals it does not appear to take place. If the dislocated bones be not replaced, they acquire, whilst their original articular cavity in the other bone is gradually wasting away, a NEW CONNEXION, either with the edge, or with more distant parts of the same bone, or with another distinct bone; which partly by absorption, partly by deposition of bone,

and the adaptation thus effected by opposite means as well as by the production of articular ligaments, often becomes, in time, a tolerably good NEW JOINT,[5] which in a certain degree restores the use of the limb. The IRREGULAR CLOSE CONNEXION may partly affect such bones as are immovably connected with each other, this is called CONSOLIDATION OF BONES, *concretio ossium*,[6] or it may, as a more distinct and important vice, affect two bones movably connected, the CONSOLIDATION OF JOINTS, *anchylosis, ankylosis.*[7] This vice is very common in man and animals,[8] and if it have attained only a trifling extent, and there still remain some motion in the joint, it is called STIFFNESS OF THE JOINT, or FALSE, IMPERFECT ANCHYLOSIS, *rigiditas articulorum, anchylosis spuria, incompleta;* but if it be complete, then it is *anchylosis vera;* consolidation of the articular surfaces with each other, ossification of the articular ligaments, and the irregular deposition of bone in and about the joint, are the next causes of anchylosis.[9] Sometimes this is a congenital vice;[10] it rarely occurs in youth, more frequently in more advanced age; in rare instances it occurs in almost all the joints of the body at once.[11] Some instances are also given, in which anchylosed joints having been separated by violence, have again become movable.[12]

(1) Dislocatio, especially in dislocations; the most remarkable instance I have seen was in the Anatomical Museum at Vienna, No. 297; the dislocated head of the right upper arm bone is thrust between the second and third ribs almost two inches into the chest, and remained there many years, until it had become soft.

(2) Many examples in *Plouquet's* Repertor. Art. Ossis Diastasis.—*Ludwig's* Program. de diastasi, Leipzig, 1620, includes several dissertations.—If the diastasis occur in youth and be long continued, the intermass of the bones expand;—if this be not the case it is usually torn.

(3) *Hamberger* D. de luxationibus et subluxationibus. Jen. 1746.—*Henkel* Abhandlung von Beinbrüchen und Verrenkungen. 8vo. Berlin, 1759.—*Bordenave* D. de luxationibus. Paris, 1764.—*Pott*, Remarks on Fractures and Dislocations. 8vo. Lond. 1768.—*Aitken* Ueber Beinbrüche und Verrenkungen mit Anmerk. von *Reich*. 8vo. Nürnb. 1793.—*Bernstein* Ueber Verrenkungen und Beinbrüche. 8vo. Jena, 1802. 2d edit. Jena, 1818.—*Laemmerhirt* Taschenbuch über Beinbrüche und Verrenkungen. Berlin, 1806.—*Caspari* Anat. chir. Darstellung der Verrenkungen, u. s. w. 8vo. Leipz. 1821.—*A. Cooper*, A treatise on Dislocations and on fractures of the joints. 4to. Lond. 1822, with plates.—*J. M. Cunningham*, A synoptical chart of the various Dislocations to which the human frame is subjected. Lond. 1827.

(4) *Juncker* D. de causis luxationum internis. Halæ, 1761.—*Rust* Arthrokakologie, oder über die Verrenkungen durch innere Bedingung und über die Anwendung des Glüheisens. 4to. Wien, 1817, with plates.

(5) *Howship* in Medico-chir. Transact. Vol. III. Part II. 1817: und praktische Beobachtungen aus der Wundarzneikunst und Krankheitszergliederungskunde; übers. v. *Schulze*, p. 435, 8vo. Halberstadt, 1819, plate 6, fig. 5, plate 7 and 8.—*A. Cooper* and *Travers*, Surgical Essays, Part I.—*Warren* in New England Journ. of Medicine and Surgery, Boston, 1814, April, with drawings.—*Todd* in Dublin Hospital Reports and Communications in Medicine and Surgery, Vol. III. Dublin, 1822.—*Hesselbach* Beschreibung der pathol. Präparate zu Würzburg, No. 85—91, and 684. *Otto* Verzeichniss der anat. Präparatensamm-

lung, No. 3440, 3442, 3443, 3492, and several others. — *C. M. Geisler* D. de Pseudarthrosi a luxatione proficiscente in genere. 8vo. Berol, 1827.

(6) Here belong, for instance, the early, or even congenital consolidation of the bones of the skull, of the nose, of the two halves of the lower jaw, of the epiphyses with the diaphyses, the teeth with their sockets, &c.

(7) *Müller* D. de Ancylosi L. B. 1707. *v. Haller* Coll. Disp. chir. Vol. IV. No. 120. — *de Büchner* D. de Ancylosi. Erford. 1743. — *Paul* D. de Ancylosi. Argentor. 1774.—*van de Wynsperse* Dissertationes med. chir. de Ancylosi. L. B. 1785, with figures. — *van Doeveren* D. de Ancylosi. L. B. 1783.— *Murray*, resp. *Leffler* D. de Ancylosi. Upsal. 1797. — *Rudolphi* Schwed. Annalen. Part I. p. 132.—*Jamain* Diss. sur l'ancylose. 4to. Paris, 1806.—*Carmichael*, in Edinb. med. and surg. Journ. Vol. V. p. 185.

(8) For instance, on the spine of horses, mules, asses, and oxen; in spavin and grease of horses; on the knee of a monkey; and not rarely on the joints of wild beasts and birds which have been injured; to wit, in wolves, No. 3575 and 3576, in a bird, No. 3594 of Bresl. Mus. I also saw one on the heel-joint of a young kangaroo.

(9) Gout, osteomalacy, caries, fracture and injuries in the neighbourhood of a joint, most commonly produce anchylosis; also the long-continued rest of a limb; for instance, the Indian Fakirs, who, for penance, do not move a joint for a whole year, often suffer anchylosis.

(10) I have seen this several times in monsters of men, sheep and oxen, especially on the spine and ribs; on the knee of a new-born child, *Yeatman* in Lond. med. and phys. Journ. Nov. 1824; on the spine of calves and lambs, No. 3032, 3034, 3324, of Bresl. Mus.; in a calf, *H. Jaeger* in *Meckel's* Archiv f. Anatomie und Physiol. 1826, No. 1, p. 79.

(11) *Columbus* de re anatomica L. XV. p. 485. — *B. Connor*, de Stupendo ossium coalitu. Oxon. 1695; and in Philos. Transact. 1695, p. 21.—*Deslandes* in Mém. de l'Academie des Sc. 1716, in a child. — *Smith*, Naturalis historia Hiberniæ comitatuum. Dublin, 1744. — *Baader* Observationes medicæ incisione cadaverum illustratæ, 1763, p. 80. — Gentleman's Magazine, Sept. 1787. — *Ramsay* Philos. Transact. abridg. Vol. IX. p. 24, with an engraving of the skeleton which is in the museum at Trinity College, Dublin. The skeleton of Jeffs, in the Hunterian Museum, at London, is similar; and there are two skeletons in the Cabinet d'Ecole de Médecine of Paris; compare hereon *Percy*, Bulletin de la Soc. philomath. Ann. X. p. 93; and in *Sédillot* Rec. période. de la Soc. de Médec. de Paris, Vol. XIII. p. 352. — *Gastellier, ib.* Vol. LIV. p. 380, and *Frank* Reise nach Paris, London, u. s. w. p. 127; — *Grabner: Maraschin* in *Omodei's* Annali universali di Medicina, Vol. XXXII. Oct. 1824; almost complete anchylosis in a skeleton in the Anatomical Museum at Berlin. v. *Walter* Anat. Mus. Vol. II. No. 463, p. 77.

(12) *Job. von Meek'ren* Observat. Cap. LXIV. p. 297; in such the consolidation was probably only slight.

§ 110.

The natural COLOUR[1] of bones deviates variously, in the altered component proportions of the jelly, fat, blood, and lime found in them; if the latter be in excess and the former diminished, the bone appears too WHITE, thus in certain forms of gout it is IVORY-LIKE,[2] in necrosis often WHITE AS CHALK; should the bones be very fat and deficient in lime, they are sometimes completely TRANSPARENT,[3] more frequently very YELLOW; inflamed, scorbutic, and rickety bones when examined recently are more or less RED, but after some time mostly GREYISH; in the not rare morbid effusion of blood into the diploe of bones, they are spotted of a DEEP RED OR BLUISH

COLOUR;[4] carious and necrotic bones are often DISCOLOURED BROWNISH and even BLACK: the bones are irregularly coloured in rare cases, by pigments morbidly produced in the body; for instance, YELLOW IN JAUNDICE,[5] and BLACKISH IN MELANOSE;[6] in one instance, BLUE on the upper surface of exfoliated portions of bone;[7] but this is more frequently produced by extraneous colouring matter, thus YELLOW from carrots,[8] RED from madder[8*] and *galium aparine*, DUSKY or BLACKISH, if preparations of peruvian bark, oak bark, rhatany, nitrate of silver,[9] be applied on bare bones, &c.; also after death the bones easily assume an extraneous colour, as a DARK BROWN or BLACKISH colour from putrefaction and lying in black earth, a REDDISH from ochrous earth, and a GREENISH colour from that impregnated with oxyds of copper.[10]

(1) *H. F. Isenflamm* Ueber die Verschiedenheit der Knochenfarbe als Diss. Dorpat, 1809, enlarged on in his Anatomischen Untersuchungen. 8vo. Erlang. 1822 p. 3—45.

(2) I have several times found this. Compare also *v. Sommerring* Ueber die Gichtknochen in *Blumenbach's* medicin. Bibliothek, Vol. III. Part III. p. 508.

(3) *Otto* Verzeichniss der anat. Präparatensammlung, No. 3020.

(4) I have several times found such spots on the bones of the skull and of the pelvis; on others also, however, which have a thinner shell. Compare Verzeichniss der anat. Präparatensammlung, No. 3119 and 3120.

(5) *Lieutaud* Hist. anat. medica, Vol. I. L. I. Observ. 817.—*J. Andree*, Considerations on bilious diseases, &c. London, 1790.—*Stoerck* Ann. medic. I. p. 150.—*Stoll* Ratio medendi, übers. von *Fabri*. Vol. III. Part II. p. 148.—*Wrisberg* Descript. Embryon, p. 6.—*v. Soemmerring* Vom Bau des menschlichen Körpers. 2d edit. Part I. p. 7.—*Isenflamm*, p. 29.—I have also seen this several times, especially in icterus neonatorum.

(6) *Howe* and *Alison* in Transact. of the med. chir. Soc. Edinburgh, Vol. I. 1824, No. 13.

(7) *Menegazzi* in *Brera's* Giornale di Medic. prat. Part I. p. 1.

(8) In Geese. Fränkische Sammlungen, u. s. w. Part II. p. 11.

(8*) [De coloratis Animalium quorundam vivorum ossibus, in Comm. Bonoens, Vol. II. p. 129. — *M. Bazani* De ossium colorandorum artificio per radicem rubiæ, *ib.* Part II. p. 124. T.]

(9) As to the intentional or accidental colouring of the teeth, see further, on the teeth.

(10) v. No. 817 and 818 in Bresl. Mus.

§ 111.

As to VICES OF CONSISTENCE of bone, these are regularly the consequence of vices of texture and indeed of inflammatory loosening or thickening; this however is not always distinguishable, and in other cases also the vices of consistence, in reality, appear only to depend on the change of nutrition or the proportions of mixture of the fluid with the earthy parts; here, therefore, we must speak of them generally. The DIMINISHED CONSISTENCE of bones appears in a double form, viz. as SOFTENING and as BRITTLENESS. The former, *mollities* or *rachitis ossium*, in a greater degree also called *osteomalacia, malacosteon, osteosarcosis*,[1] is produced to a less extent in bones,

os du tronc d'une femme. 8vo. Majence, 1804, with fig.—*Fleichmann* in den Abhandl. der phys. medic. Societät zu Erlangen, Vol. I. No. 1.—*Monteggia* in *Sédillot* Rec. période. de la Soc. de Méd. de Paris, Vol. LXI. p. 75.—*Jurine* in Journ. de Médec. 1810, Dec. p. 499.—*Keller* D. de ossium emollitione morbosa, &c. L. B. 1816.—Some remarkable cases of general osteomalacy are described by *Morand* Histoire de la maladie singuliere et de l'Examen du cadavre d'une femme (*Supiot*) devenue tout a fait contrefaite par un ramollissement général des os. Paris, 1752.—*Hosty*, An account on the case of A. E. Queriot, &c. Philos. Transact. 1753, Vol. XLVIII. p. 26.—*H. Thomson* in Med. Observat. and Inquiris. Vol. V. p. 259. — *Gooch's* Chir. Works. Vol. II. 1792. p. 395—399. —*Vrolick* Mémoires sur quelques sujets intéressans d'Anatomie et de Physiologie trad. du Hollandais par *Fallot*. 4to. Amsterd. 1822.—*J. Howship* in Transact. of the med. chir. Society of Edinburgh, 1826. Vol. II.—[*Astruc* de Morbis venereis. Lib. IV. c. 4. — *Tauvry* in Mém. de l'Acad. Roy. Paris, 1700, a case of a girl whose bones were as soft as wax, and bent every time she was moved; the teeth, however, still retained their original hardness.—I recollect a boy of seven or eight years old, who was brought into St. Thomas's Hospital, some years ago, having fallen down and bent the fore arm, about its middle, nearly to a right angle; slight extension straitened it, and he did well. T.]

(2) Compare above, § 104, note 2.

(3) To wit, I have observed it in puppies, calves, lambs, and young monkeys; examples of the monkey, dog, and porcupine are given by *Sandifort*, Mus. Anat. Vol. III. p. 275, No. 908, 909.—*J. Amesbury*, Observations on the nature and treatment of fractures of the upper third of the thighbone, and of fractures of long standing, &c., with engravings. London, 1828.—Many instances of spontaneously cured fractures and wounds of bone are given by *Sandifort*, Mus. Anat. Vol. III. p. 202, and in the Recueil période. de la Soc. de Médec. de Paris, Vol. LXVI. p. 249. I have also observed them more rarely on the mycetes fuscus, didelphis Azaræ, bradypus didactylus, herpestes ichneumon, and on a frog.

(4) *J. P. Frank* Delect. opusculor. Vol. II. p. 304.—*Biermayer* Musæum anat. pathol. No. 440. p. 74. I saw an instance of osteomalacia in a woman of eighty years old, in the Anatomical Museum at Bonn. Imperfect fractures have been observed by *Lisfranc*. v. Revue méd. franç. et étrang. 1827. Vol. X. Miscellen.

(5) I found it in the horse, ox, sheep, dog, cat, rat, in very many monkeys, and in one polar bear; in birds this disease appears to me more rare. Compare *Dupuy* De l'affection tuberculeuse. 8vo. Paris, 1817. p. 50 and 265—268.—*Laubender* Theoret. prakt. Handbuch der Thierheilk, Vol. IV. p. 112. Erfurt, 1812.—In the mule and sheep, *Robertson* Vollst. Werk über die Pferdewissenschaft, herausg. von *Mogalla*. Vol. II. p. 235. Breslau, 1800.—In a lioness. Ephem. N. C. Ann. 1671. Obs. 5, p. 6.

(6) I have seen one case of this kind in the Anat. pathol. Mus. at Vienna.

(7) *Pott* in Phil. Trans. 1753, No. 459.—*Lisfranc*.

(8) I saw one example on the hand in the anatomical collection of *Dr. Pattison*, at Glasgow.

(9) Fragility of bones may also be produced by the above-mentioned diseases operating very injuriously upon the bony system. — *Waldschmidt* D. de fracturis ossium sine violenta causa externa. Kilon. 1721.—*Nicod* D. sur la fragilité des os. Paris, 1807.—*Villermé* in Journ. de Médec. de *Leroux*, Vol. XXXVII. p. 331.—Many instances in *Reuss* Repert. Comment. Vol. XIV. p. 254.—*de Plouquet* Repertor. Art. Ossis Fragilitas; also Medic. Observ. and Inquiries, Vol. V.—*Smith*, in Lond. Medic. Repository, Vol. IV. Sept.—*Chevalier* in Journ. de Médec. 1810, Oct. p. 276.—The Medical Repository by *Mitchill*, *Pascalis*, and *Akerly*, new series, Vol. I. New-York, 1812 and 1813.—*Hutchinson* in Lond. Med. Reposit. April, 1815.—*Gastellier* in *Leroux* Journ. de Médec. Chir. et Pharm. Vol. XXXIII. Juill. 1815.—*Haime* in Journ. gén. de Médec. 1819. Vol. LXV. No. 272, p. 90. —*Nicod* in Annuaire médic. chir. des Hôpitaux et Hospices civiles de Paris, p. 494. Paris, 1819.—*Krüger-Hausen* in *v. Graefe's* and *v. Walther's* Journ. f. Chir. Vol. III. Part IV. p. 647.—*Bergmann* in *Nasse's* Zeitschrift für die Anthropologie, 1823. Part II. p. 413.—*Whitelaw Ainslie* on Elephantiasis,

in Trans. of Roy. Asiat. Soc. Vol. I. Part II. p. 282. London, 1826.—*Otto* Selt. Beobacht. Vol. I. No. 40, p. 81, and Verzeichniss der anat. Präparatensammlung, No. 3019. At Breslau the disease is very common in consequence of scrofula, syphilis, and cancer; *Ekström* observed it following Radesyge. v. Ars. Berättelse om Svenska Läkare-Sällskapets Arbeten. Stockh. 1825.

(9*) [*J. Pringle* in Phil. Trans. Vol. XLVIII. p. 406, mentions a woman of thirty-one, whose leg was broken merely in walking; no callus (it is said, perhaps more properly, no lime,) was generated, and soon after the lime was removed from all the bones, which, after death, could be cut without turning the edge of a knife. T.]

(10) *Dupuy.*—*Gleditsch* Abhandlung über eine seltene Art des Knockenbruchs bei dem Rindviche u. s. w. Berlin, 1737. I have observed a great degree of brittleness in several monkeys, in a hyæna, a two-year old lioness, in some dogs, stags, and roes.

§ 112.

To the above described vices, those of CONTINUITY in a single bone naturally follow. These are produced partly by the more or less deep penetration of sharp instruments, and are therefore called WOUNDS OF BONE, *vulnera ossium;*[1] partly they arise from various other mechanical causes operating either externally or within the body itself,[2] and are then called FRACTURES OF BONES, *fracturæ ossium.*[3] The latter are IMPERFECT, *fracturæ incompletæ,*[4] if the natural connexion of a bone is only partially broken, as in FISSURE OF BONE, *fissura,* and the cracking of bones which are not very brittle; or as usual, COMPLETE FRACTURE, *fracturæ completæ,* in which the bone is completely divided into two or more pieces. Such fracture is either SIMPLE, *simplex,*[5] or COMPOUND, to which also belongs the SPLITTING, or CRUSHING of the bone, *fractura comminuta;* further, according to its direction, it is OBLIQUE, *fr. obliqua,* which is the most common, TRANSVERSE, *fr. transversa,*[6] LONGITUDINAL, *fr. longitudinalis,*[7] or lastly, IRREGULAR, *fr. irregularis.*

(1) *Heister* D. de vulneribus ossium rite curandis. Helmst. 1753. in *Haller's* Diss. chir. IV. No. 123.—*P. G. van Hoorn* D. de iis, quæ in partibus membri, præsertim osseis, amputatione vulneratis, notanda sunt. L. B. 1803.—*Hennen,* Principles of Military Surgery. 8vo. Edinb. 1829.—Dict. d. Sc. médic. Art. Plaie. p. 83. Here belong piercing and perforating stab, cut, and gunshot wounds, amputations, trepannings, sawings off, chisellings, &c.; sometimes also in adults a piece of bone is cut off smooth without splintering.

(2) From violent muscular exertion; this is especially the case with the olecranon, the knee-cap, and the heelbone, although also with long and other bones; horses break even the lower jaw in biting, the dorsal vertebræ in drawing, &c. Compare *Nicod* Diss. Essai sur la contraction musculaire comme cause de la fracture. Paris, 1807.

(3) *Pott,* Remarks on fractures and dislocations. 8vo. Lond. 1768.—*Aitken.* On fractures and luxations. 8vo. Lond. 1790.—*Bernstein* Ueber Verrenkungen und Beinbrüche. 8vo. Jena, 1819.—*A. Cooper,* Treatise on dislocations and on fractures of the joints. 4to. Lond. 1823, with engraving.—*J. Amesbury,* On the nature and treatment of Fractures, &c. 8vo. Lond. 1828.—*Richter* Handbuch der Lehre von den Brüchen und Verrenkungen der Knochen, 8vo. Berlin, 1827, with many lithographic plates.—*Pantaleon Binz* Ueber die verschiedenen

Knochenbrüche der Hausthiere, besonders der Pferde, u. s. w. 8vo. Tubing. 1824.—*J. Peterka* Gründliche und kurzgefasste Darstellung von verschiedenen Arten Knochenbrüchen und Hufkrankheiten unserer Haus-und Nutzthiere. 8vo. Prag. 1827, with four lithographic plates.

(4) *Boyer*, in his Traité des maladies chirurgicales, Vol. III. p. 19, very incorrectly disclaims incomplete fractures; they occur not merely in morbid and in young bones, which have little lime, but also in the healthy bones of adults. In a boy, six years old, affected with the blue disease, I found, after a fall, both fore-arms imperfectly broken; so also the radius of a lion, No. 3577, a fibula, No. 3890, in Bresl. Mus., the breast-bone of an adult, several skull-bones of newly born children, and of the stag and roe kinds; also in adults, the internal table will snap off whilst the external remains uninjured. Other instances are in *Regnault* in Journ. de Médec. Vol. XXVI. p. 159.—*Cheselden*, Anatomy of the human body, observed an imperfect fracture in the ribs of children; and on the ribs and cubit of grown up persons it was seen by *Chaussier* Recueil de Mémoires, etc. 8vo. Paris, 1824, p. 447, note; on the fibula by *Campaignac*, v. *von Froriep's* Notizen, 1826, No. 321, p. 207. Compare also *Barton* in American medical Recorder, Vol. IV. p. 1, Philadelphia, Jan. 1821; on the ribs by *Marjolin*, v. Archives général, Mai, 1827.

(5) *J. Dunlap* D. de fracturis simplicibus. Edinb. 1823.

(6) Transverse fracture of the knee-cap is not rare, (see below); next of the shoulder-blade, which I have seen in several collections. Compare also *Allan*, System of pathological and operative Surgery, Vol. II. p. 61; on the breast-bone, *Otto* Verzeichniss, No. 3474, and *Haugk* D. s. observat. de fractura sterni et vertebrarum. 4to. Lips. 1816, with plates.—*Chaussier* exhibited such a breast-bone to the Academy at Paris, on the 8th of May, 1826; *Bonn* and *Camper* have also noticed it in the body of cylindrical bones; to transverse fracture belongs also the breaking off of the epiphyses; v. *G. Ch. Reichel* D. de epiphysium ab ossium diaphysi deductione. Lips. 1759, with figs.—Instances are given by *Champion* and *J. Cloquet*, v. *Laurent* in Journ. compl. au Dict. des Sc. méd. Paris, 1818. Vol. I. p. 317—226.—*Julia Fontenelle* in Archiv. génér. de Médec. Vol. IX. Octobr. 1825.—*Baumetz*, v. *von Froriep's* Notizen, Vol. VI. No. 6, p. 96.

(7) Improperly do *Petit*, *Boyer* and others disallow this; it has been several times observed, especially after shot wounds. Compare *Hoffmann* D. de ossium cylindricorum fissura. 4to. Lips. 1764, with figs.—*Eccard* Epistola de ossium cylindricorum fissura longitudinali. Lips. 1784.—*Duverney* Traité des maladies des os. Vol. I. p. 167.—*Leveillé* Nouvelle doctrine chirurgicale. Vol. II. p. 158. —*S. Cooper*, Surgical Dictionary, Art. Amputation.—I have seen such fracture of the knee-cap, No. 3908, in Bresl. Mus., and of the hip-bone of a horse in the Veterinary School of Copenhagen.—*Lisfranc.*

§ 113.

To the consideration of the broken connexion of a single bone is very naturally consequent, that of its REUNION, *reunio*,[1] as well as the REPRODUCTION, *regeneratio seu reproductio*,[2] of such bony parts as have been lost by injuries or diseases, for instance, caries and mortification. Both have alike many resemblances with the similar processes in soft parts, and with the original production of bone. The REUNION of the divided bony parts is effected by the effusion of a mass which glues the edges of the wound together, gradually becomes organized and ossified, that is, by adhesion or *per primam intentionem*, which is effected in somewhat longer period than in the soft parts, on account of the peculiarities of the bones; thus, then, in part, pieces of bone which have been completely divided by

sharp instruments are very commonly healed;[3] in part, fractures of bone are easily united by *callus.*[4] In the latter instance the following is the process: soon after the fracture has occurred, blood and coagulated lymph is poured out in greater or less quantity from the ends of the broken bone, from its periosteal and medullary membrane, as well as from the neighbouring somewhat injured soft parts, which glue all the affected parts together and produce the so-called callous swelling, which at first is jelly-like, soft, and reddish, gradually becomes harder, and as it were cartilaginous and paler. Whilst the torn original periosteum is absorbed, there is formed a new one around the callous swelling, which is connected with the healthy periosteum on the ends of the bone as well as with the other surrounding soft parts, and, together with the whole callus, contains blood-vessels on all sides, whence lime is deposited, and the callus gradually converted into several hard bones. The ossification usually takes place first externally, although sometimes also earlier on other parts, and as the mass interposed between the two ends of the bone becomes ossified, if it be a tubular bone, the medullary cavity is at the same time divided into two parts, which division, however, is at a later period again done away with by absorption. As the broken ends of the bone are usually at the same time rather soft, and have been deprived of their angles and points by absorption, and not unfrequently the primary splinters of the bone surrounded by callus during the cure, and again become living,[5] so at last do the old and new bone assimilate, and the original form is again tolerably reproduced. In a similar way, is a bone from which the middle portion has been removed, as also two distinct bones from which the articular ends have been artificially cut off, united.[6] This natural process of uniting broken bones may, however, be DISTURBED in various ways;[7] for instance, by suppuration and mortification in complicated fractures, by great debility, by syphilis, scurvy, rickets, osteomalacia, pregnancy, suckling, improper position of the broken bones, and their frequent motion.[7*] In such cases either a too large and mishapen mass of callus, *callus luxurians*, is thrown out,[8] or the callus is formed in too small quantity, and does not become hard, so that one PART OF THE BONE REMAINS MOVABLE UPON THE OTHER, or the ends of the bones become cicatrized, and a NEW JOINT is produced between them,[9] in which we sometimes find plates of cartilage, articular ligaments, and synovial membrane, as in the normal joints. The processes of bone also which are broken within the capsular ligament, do not appear to heal by bony substance but only by ligamentous bands.[10]

(1) Compare above, § 56, and the writings of the surgeons. A good plate is given by *Bonn*, Tabulæ ossium morbosorum, II. fig. 1. — *van der Leeuw* D. de ossium vulneratorum et fractorum consolidatione. Groening, 1785.—*Howship*, on the morbid appearances and structure of bones, in Med. Chir. Trans. Vol. X. p. 176. — *M. J. Weber* in Nov. Actis Acad. W. Cur. Vol. II. Part II. p. 709, pl. 60—64.

(2) Compare § 56. — *Reuss* Repert. Comment. Vol. X. p. 41. Vol. XIV. p. 260.—*de Plouquet* Repert. Art. Ossis. Regeneratio.—*M. Troja* De Novorum ossium in integris aut maximis ob morbos deperditionibus regeneratione experimenta, Lutet. 1775; and Osservazioni ed esperimenti sulle ossa, in supplemento ad un opera sulla regenerazione delle ossa, etc. 4to. Napoli, 1814, with engravings.—*Koeler* Experimenta circa regenerationem ossium. Goett. 1786.—*Blumenbach* in *Richter's* Chir. Bibliothek. Vol. VI. p. 107. — *Maret* in Mémoirs de Dijon, Vol. II. p. 85. — *Baronio* Della regenerazione delle ossa in Memor. della Soc. Italiana, Vol. IV. p. 430. — *Leveillé* in Mémoire de Physiologie et de Chirurgie pratique par *Scarpa* et *Leveillé*. Mém. 4. Paris, 1804.—*Osthoff* in *v. Siebold's* Chiron. II. p. 539. — *Bouillancy* in Journ. Général de Médec. Août, 1807.— *Eggers* Von der Wiedervereinigung. Würz. 1821. — *Charmeil* Récherches sur les Metastases, suivies de nouvelles experiences sur la regéneration des os. Metz. 1821, with engravings. — *Eschholz* D. de ossium genesi et regeneratione. 8vo. Berol. 1823, with engravings.—*Meding* D. de regeneratione ossium per experimenta illustrata. 4to. Lips. 1825, with engravings; and in the Dresdner Zeitschrift f. Natur-und Heilkunde, Vol. III. Part III. p. 305.—*Knox* in Edinb. Med. and Surg. Journ. June, 1822, and Vol. XVIII. p. 62, April, 1823. — *Kortum* D. prop. experimenta et observationes circa regenerationem ossium. 4to. Berol. 1824, with lithographic plates. — *Ernst* D. de regeneratione ossium in genere, etc. 8vo. Bonnæ, 1824.—*M. Troja* Neue Beobachtungen über die Knochen, translated by *v. Schoenberg*. 4to. Erlangen,1828.—[A good example of adhesion by the first intention in bones, is given in the Lancet, 1828–29, p. 401, in a case of vertical division of the whole finger by a chaff-knife, which was perfectly cured in twenty-eight days. T.]

(3) For instance, the phalanges removed from the fingers, and large pieces of bone from the skull, No. 8250 of Bresl. Mus.; further, the pieces sawn off by the trepan, v. No. 3195, in my Verzeichniss, u. s. w.

(4) *Reuss* Repertor. Comment. Vol. X. p. 363. — *de Plouquet* Repertor. Art. Callus.—Dict. des Sc. médicales, Vol. XXXVIII. p. 416. — *Müller* D. m. chir. de callo ossium. 4to. Norimb. 1707. — *Bajer* D. de callo ossium. Norimb. 1807.—*Boehmer* Pr. de callo ossium e rubiæ tinctorum radicis pastu infectorum. Lips. 1752, and Pr. de ossium callo. Lips. 1758.—*Detlef* D. ossium calli generationem, etc. Götting. 1753.—*Delins* D. Cicatrix et callus idea nutritionis. Erlang. 1755. — *Bordenave* in *Fougeroux* Mém sur les os. Paris, 1760. — *Haller* Op. minor, II. p. 460 and 478. — *Marigues* D. phys. et chir. sur la formation du cal dans les fractures. Paris, 1783.—*Bonn* and *Marigues* phys. und chir. Abhandlung über die Natur und Erzeugung des Callus überhaupt und insbesondere von den Fehlern und Unförmlichkeiten desselben bei Beinbrüchen. 8vo. Leipz. 1786.—*Macdonald* D. de necrosi ac callo. Edinb. 1799. — *Wood* in Memoirs of the Literary and philos. Soc. of Manchester, Series II. Vol. III. 1819.—*Breschet* These. Récherches historiques et experimentales sur la formation du Cal. 4to. Paris, 1819. — Exposé de la doctrine de *Dupuytren* sur le Cal, par *Sanson* in Journ. univ. des Sc. médic. Vol. XX. p. 131. Paris, 1820. — *J. H. Reypens* Commentatio ad quæstionem ab ordine medicorum propositam: Quæritur ut exponantur variæ doctorum virorum sententiæ de origine et natura Calli ossium; dein observatis in homine, nec minus experimentis in animalibus institutis, probabilior inferatur theoria ossium fractorum coalitus; quæ præmio ornata est. 4to. Lovani 1823, with twenty experiments.—*Scarpa* Abhandlung über die Knochenexpansion und über die callus nach Frakturen a. d. Lat. 4to. Weimar, 1828.—[*P. Camper*, Observationes circa callum ossium fractorum. T.]

(5) *Breschet* and *Villermé* in *Magendie's* Journ. de Physiol. experim. Vol. I. No. 2, April, 1821, p. 116.—*Howship*, p, 89 and 97, pl. 10, fig. 6.

(6) *H. Park*, Account of a new method of treating diseases of the joints of the

knee and elbow. Lond. 1783; Cases of the excision of carious joints, by *H. Park* and *P. F. Moreau*, with Observations by *Jeffray*. Glasgow, 1806.—*Wachter* D. de articul. exstiratione. Gröningæ, 1810.—*Denové* D. sur l'utilité de la resection des os dans les membres. Paris, 1812.—*Roux* De la resection de portions d'os malades, etc. Paris, 1812.—*Rowland*, A case of an ununited fracture of the thigh, cured by sawing off the ends of the bone, in New. chir. Transact. Vol. II. No. 5.—*Crampton*, in the Dublin Hospital Reports, &c. 1827, Vol. IV.—[*Roux*, on removal of diseased joints, in Revue Médic.—*J. Syme*, Cases of excision of elbow and knee joints. v. Edinb. Med. and Surg. Journ. April, 1830. T.]

(7) *Callisen* De variis formationis calli impedimentis in Collect. Soc. med. Havn. Vol. II. No. 21, p. 189.

(7*) [A good instance of ununited fracture of the thigh bone from this cause, is related by *Somné*, in Med. Chir. Trans. Vol. XVI. p. 36. T.]

(8) *Metzger* D. de callo luxuriante. Regiom. 1793. Good plates are given in *Ludwig* de quarundam ægriter. c. h. sed. et caus. tab. 10, fig. 1 and 2. — *Heckeren* D. de osteogenesi præternaturali. L. B. 1797, fig. 1 and 2. It must be remembered that we are not now talking of callus in the same sense as the older writers.

(9) *de Plouquet* Repertor. Articulatio succedanea. — *Salzmann* D. de articulationibus quæ fracturis ossium superveniunt. 4to. Argent. 1718. — *Gras* in Journ. génér. de Méd. chir. et Pharm. August. Paris, 1800.—*Reisseisen* and *Langenbeck*, in the Neuen Bibliothek f. Chir. Part I. p. 81, ff — *Home*, in Transact. of a Society for the impr. of med. and chir. Knowl. Vol. I. p. 233, gives several instances.—*Palletta* Exercit. pathologicæ, Vol. I. p. 58.—*Flormann* resp. *Nerman* D. de articulationibus sic dictis accidentalibus, fracturas ossium interdum subsequentibus. 8vo. Lundæ, 1821. — *Schwoerer* D. de caus. et structura Pseudarthrosium, etc. 8vo. Friburg. 1822. — *Mitsching* D. de articulatione spuria et nova eam curandi methodo. 8vo. Halæ, 1822. — *Schuster* D. de articulatione præternaturali. 8vo. Landshut. 1822. — *M. Troschel* D. pseudarthrosi. 8vo. Berol. 1826, with a plate. They are not unfrequent in animals. I have seen them in dogs, cats, a fox, and several birds.—*Greve*, Erfahr. und Beobacht. über die Krankheiten der Hausthiere, Vol. II. p. 3, found an unnatural joint in a hare. Compare my Verseichniss der Breslauer Präparatensammlung, No. 2149, 2150, 2321, 2322, 3589, 3590. — *J. Tenon*, Observation Anatomique sur une articulation singuliere dans un chat formée par la nature, in Mém. de Paris, 1760, Hist. p. 50.

(10) *Callisen* Annot. circa callum ossium in Act. Soc. med. Hafn. Vol. I. No. 26, p. 312.—*A. Cooper*, On Dislocations and Fractures, &c. Lond. 1822, and his Observations on fractures of the Neck of the Thigh-bone, &c. Lond. 1823.—Compare below, the thigh-bone and knee-cap.

§ 114.

Partly in a similar manner occurs also the REPRODUCTION, *regeneratio*, of a bone. If part of it be destroyed by wounds or mortification, the reproduction occurs as in soft parts by granulation,[1] whilst in the newly produced tissue lime is also gradually and freely deposited.[1*] The bone usually forms at such part a more or less thick and deep cicatrix; in rare cases this rises even above the surface of the bone. The unattached ends of bone produced by amputation become smooth, rounded, and narrowed by absorption and contraction, and are always closed by a new mass of bone.[2] Should the bony parts have been destroyed by necrosis, there is poured out a mass very similar to callus, which, by expelling the hard dead piece,

becomes homogeneous with the healthy bone, and thus the lost bone is completely replaced.[3] In such manner large pieces of bone, and even whole bones, have been seen to be reproduced;[4] this, however, especially applies to hard and thick bones, as the spongy bones cannot be thus restored, but are cured by granulation and cicatrization with large deposit of lime in the bony tissue.[5]

(1) Compare above, § 56. The reason why holes in the skull, made by the trepan, are closed with greater difficulty, is the want of blood vessels, both as the outer and inner membranes of the bone are removed.—[*Craigie* seems to doubt whether these apertures are ever filled up. He admits, with reservation, *Weidmann's* case, pl. 12; but thinks that the cases seen by *Russell*, who states that the solid matter "possessed all the qualities of solid bone," rather resemble the reproduction after fracture than that after necrosis. v. his Elements, p. 568. T.]

(1*) [These granulations, often, however, have so strong a tendency to ossify, that it becomes a considerable inconvenience, *i. e.* they form higher than the surface of the bone in general, which prominence prevents the process of cicatrization. *John Hunter*, MSS. Lectures on Surgery. T.]

(2) *Van Hoorn* D. de iis, quæ in partibus membri præsertim osseis, amputatione vulneratis, notanda sunt, p. 36. L. B. 1803. — In rare instances, the uniting bony mass is poured out in too large quantity, and forms mishapen projections. In a hare, the foot of which had been shot off, a paw-like bony mass served as a foot. C'étoit une espece de jambe de bois, dont la nature seule avait fait les frais; *Morand* in l'Histoir. de l'Acad. des Sc. de Paris, 1770, p. 30.

(3) Compare the particular observations on necrosis.

(4) v. the writings of surgeons. — *Voigtel* Hanb. der pathol. Anatomie, Vol. I. p. 199—209.—*de Plouquet* Repertor. Ossis regeneratio, &c.

(5) Compare *Bauer* Ueber das geringe Wiedererzeugungsvermögen der schwammigen Knocken, in Heidelberger klinischen Annalen, Vol III. Part I.

§ 115.

On account of their peculiar structure and composition, the VICES OF TEXTURE of bones differ very remarkably from those of soft parts, but, like them, are they also specially produced by the inflammatory state. The PERIOSTEUM, as an essential part of living bone, not only participates in these vices of texture, if at all important, but is, when primarily affected, also often the cause of them. INFLAMMATION OF BONE, *ostitis, inflammatio ossium*,[1] attacks, indeed, all bones, but especially those which are very vascular, as young bones, the bodies of the vertebræ, the articular extremities of long bones, the bones of the hands and feet, &c.,[1*] and arises partly from external,[2] partly from internal causes, especially from scrofula, syphilis, rheumatism, gout, and metastasis in fevers and eruptive diseases. Inflammation can exist at the same time in the whole bone, or locally, only in the periosteum,[3] *periostitis*, or in the so-called medullary membrane; and in the latter case, according to the strength of the bony tissue, it is confined for a long time to the external or internal layers of the bone, although it occasionally attacks more or less the

whole tissue, especially in the spongy bones. Should this be the case, the bone becomes swollen,[4] and exhibits in its substance, as well as in the periosteum and medullary membrane, a great quantity of blood-vessels, and thereby becomes somewhat and in rare cases remarkably red. The cells and canals in the bony tissue increase in size, are irregular, run together in part by the absorption of their walls, and are filled with blood and jelly, so that the fine membranes by which they are lined are found distinctly thickened. The proportion of lime in the bone is more or less diminished according to the intensity and duration of the inflammation. We find the periosteum thickened and relaxed;[5] this is especially the case, if the inflammation of the bone arises from it, and if it have been long provoked by disease of the neighbouring soft parts. In such cases the surface of the bone generally exhibits an oftentimes very material roughness and porousness.[5*]

(1) *Glass* D. de ossium inflammationibus. L. B. 1728. *v. Haller's* Bibl. chir. Vol. II. p. 198.—*Fr. Hoffmann* de infl. oss. Halæ, 1737. — *Scrinci* D. de ossium natura, horumque inflammatione in genere, etc. Pragæ, 1743. — *Wallerian* Lectiones curiosæ de morbis ex ossium inflammatione ortis. Regiom. 1764. — *Nebel* Pr. de oss. inflammationibus. Giessæ, 1778.—*Flormann* D. de infl. ossium. Lund. 1799.—*Soemmerring* de morbis vasorum absorbentibus, p. 164.—*Tornero* in Mémor. Acad. de la R. Soc. de Sevilla, Vol. III. p. 131. — *Victorino, ib.* Vol. V. p. 62.—*Schramm* D. de oss. inflam. Altdorf. 1805. — *Naumann* D. de ostitide. 4to. Lips. 1818.—*Hake* Comm. de oss. inflam. 8vo. Goett. 1821.—*Howship*, On the morbid appearances and structure of bone, in the Med. chir. Trans. Vol. X. p. 176.—*Goetz* D. de ostitide. 8vo. Landshuti, 1822.

(1*) [Soft bones, and the soft parts of hard bones, are more subject to inflammation than others. *J. Hunter*, MSS. T.]

(2) Cold, but especially mechanical influences on the bone itself, or upon the neighbouring soft parts, as muscles, synovial membranes, &c. from which the inflammation extends itself further.

(3) With reference to idiopathic inflammation of the periosteum, compare especially, *Ph. Crampton*, in Dublin hospital reports and communications, &c. Vol. I. p. 337—397. — *Bradley Tylor* mentions a remarkable instance of fatal periostitis in the American Medic. Recorder. Vol. II. No. 1. Philadelphia, 1819.—*Meiselbach* D. de periostei inflammatione. 8vo. Halæ, 1824.

(4) All the bony tumours, which are indeed sometimes very obscure, may be produced by an inflammatory state; the kind of loosening and swelling varies considerably. Compare the following §§.

(5) It has been once seen half an inch thick, upon the skull, after an injury, v. *Trye* in Med. Communic. Vol. II. London, 1790. I have seen it in tumours, with growth of bone even an inch thick.—[The periosteum becomes very easy of separation after inflammation, if the ossifying disposition does not take place. *J. Hunter*, MSS. T.]

(5*) [Ossific inflammation is distinguishable after death by the loss of shape. *J. Hunter*, MSS. T.]

§ 116.

To the terminations of inflammation of bones, which when found in a distinct degree, is rarely cured by resolution, belong especially SUPPURATION OF BONE, ULCERATION and

MORTIFICATION, *caries.*[1] This disease is very similar to the ulceration of soft parts, and, like it, varies much according to the causes giving rise to it,[2] of age, of the parts attacked, &c.; but it always consists in a greater or less destruction and discolouring of the bone, with secretion of pus.[3] Young and spongy bones largely supplied with vessels most commonly become carious.[3*] In many cases, in consequence of the destruction of the neighbouring fleshy parts, and of the parts surrounding the articular extremities,[4] the periosteum and the upper surface of the bone become first destroyed, *caries externa;* more commonly the disease commences in the interior of the bone, *caries centralis,*[5] then sometimes forms a circumscribed abscess, *osteoapostema,* and frequently one or several sinuses, OSSEOUS FISTULAS, make their way to the surface of the bone.[5*] A peculiar and very malignant form of bony mortification is the so-called PÆDARTHROCACY, *spina ventosa,*[6] *pædarthrocace.*[7] The characteristic of this disease is a malignant bony tumour originating from within, with very great swelling of the diseased bone, and often accompanied with a disposition to deposit lime in the neighbourhood of the tumour, in form of points or spines. The latter, however, is not always the case, and the bone forms not unfrequently, in spina ventosa, a large bladder-like, tolerably smooth enlargement, without any bony increment. In the interior of this spina ventosa we find a very loose bony tissue with spongy cellular tissue, abscesses, and sinuses, and not rarely also cavities filled with lymph and blood. The spina ventosa attacks hard and thick as well as spongy bones;[7*] it affects, in children, the articular ends of bones which are swollen by rickets, the so-called double joints, and thus we are led to call it especially pædarthrocacy.

(1) Compare *de Plouquet* Repertor. Ossis Caries. — *Reuss* Repert. Comm. Vol. XII. p. 236.—*Heinze* D. de carie ossium. Gryph. 1751.—*Fitzgerald* D. de carr. oss. Monspel. 1752. — *Rauschert* D. de c. o. L. B. 1706; in *Haller's* Bibl. chir. Vol. II. p. 422. — *Nicolai* D. de c. o. in genere. Jen. 1762.—[*C. Barberis* De ossium carie. 4to. Monsp. 1775. T.]—*Ferrand* D. de c. o. Paris, 1765. — *Piderit* Geschichte eines sehr merkwürdigen Beinfrasses. 8vo. Kassel, 1781. —*Ulmann* D. s. ossium cariem. Marb. 1795.—*Delzeules* D. sur la necrose et la carie. 8vo. Paris, 1802.—*Levret* D. sur la carie. 4to. Paris, 1805. —*Juan* D. sur la carie. 4to. Paris, 1806. — *Walter,* D. de carie. Helmst. 1807. — *Louis* D. de carie vera. Erlang. 1807. — *Mariglier* D. de carie. 4to. Paris, 1811. — *Wissmann* Observationes de rite cognoscendis et curandis nudatione, carie et necrosi ossium. 8vo. Halæ, 1820. — *Schmoelzl* D. de ossium carie. Landshut. 1823.—*Wehmeyer* D. de ossium carie. 8vo. Rostock, 1826.— In animals, caries is much more rare than in man; the scrofulous, however, occurs in confined animals, and caries in the spine of horses, from poll evil, saddle-gall, ulcer on the croup. Compare No. 3246, 3351, 3520, 3521, 3788, 3789, of the Breslau Museum.—A cured caries on the skull of a monkey, v. *Sandifort,* Mus. Anat. Vol. III. p. 276, No. 919.

(2) For instance, the caries from mechanical causes, the malignant caries from internal causes, the scorbutic, scrofulous, syphilitic, the corroding from pox, the cancerous, &c.

(3) This is usually at first, though not always, thin, ichorous, very stinking, mingled with broken up bony fragments, and, according to the greater quantity of salts, especially phosphates, which it contains, blackening a silver sound.

(3*) [Suppuration does not so often take place in bone as in soft parts, because when it does take place the effects are so very serious. Although suppuration sometimes takes place in the substance of bones, yet the periosteum of bones being more liable to inflammation, more frequently suppurates, and the bone becomes affected in this way. *J. Hunter*, MSS. T.]

(4) Compare *Eck* D. de carie articulorum externa cum interna comparata. 8vo. Berol. 1818, with engravings.

(5) Compare especially, *Rust* Arthrokakologie, oder über die Verrenkungen durch innere Bedingung und über die Anwendung des Glüheisens. 4to. Wien, 1817, with eight engravings.

(5*) [Bones are not very liable to suppuration, performing many operations without this process. *J. Hunter*, MSS. T.]

(6) Also *Ventositas spinæ*, *Arthrocace*, *Teredo*, and falsely BONY CANCER. Much confusion occurs in writers, with reference to spina ventosa. Many cases of morbus coxarius, of tumor albus, &c., belong here. — *N. Massa*, Epist. medic. 4to. p. 108, Venet. 1550, first used the name *spina ventosa.*—The older writers, *de Plouquet* Repert. Art. Pædarthrocace, and *Reuss* Repert. Comment. Vol. XIV. p. 261—263. — *Hemmer* D. de spina ventosa. Hafniæ, 1595. — *Augustin* D. de Spina ventosa ossium. 4to. Halæ, 1794, with four plates.—*G. Ghioni* Memoria sopra la detta Spina ventosa. 8vo. Parma, 1798.—*Lagresie* Observations sur l'amputation de la cuisse, necessitée par le spina ventosa du tibia et du peroné, etc. 8vo. Paris, Ann. VII. — *Houzelot* D. sur les maladies du systeme lymphatico-sanguins des os, connues sous les differens noms de Pædarthrocace, de spina ventosa, d'osteosarcome, ou de carnifications des os. 4to. Paris, 1804.—*Vandenzaude* D. sur le spina ventosa. 4to. Paris, 1805. — *Suchchardt* Annotata quædam de spina ventosa, etc. 8vo. Marburgi, 1817. — *Haenel* D. de spina ventosa. 4to. Lips. 1823, with plates.—*Stark*, Prog. Historia morbi ossium faciei memoratu digna, cum nonnullis adnotationibus in spinum ventosam et exostosin Contin. I. 4to. Jenæ, 1827. — Good engravings in *Sandifort's* Mus. anat. tab. 89, fig. 1—3; tab. 320, 321, 424—474. In animals, spina ventosa occurs not very rarely, especially in the jaws of oxen and horses, and in their feet. v. No. 3166, 3168, 3868, of the Bresl. Mus. in the tip of the tail of monkeys, of the coati mondi, of a camelion, No. 4859, &c.—*Stark*, &c. Continuatio, II. Prog.—*R. Kraner* D. de pancreatitide. 4to. Jenæ, 1828.—[*J. Pandolphinus* De ventositatis spinæ sævissimo morbo. 12mo. Norimb. 1674.—*H. Meer* De spina ventosa. 4to. Duisb. ad Rhen. 1729. T.]

(7) *Severinus* Tractatus de pædarthrocace, etc. in de recondita abscessuum natura, p. 335. L. B. 1724.—*Fausius* D. de pædarthrocace. Heidelberg. 1657.—*Chun* D. de pædarthrocace. Marburg. 1697. — *Schmidt* D. de pædarthrocace. L. B. 1721.—*Nebel* D. de P. Heidelb. 1745.—*Rosenblad* D. s. casum pædarthrocaces. Lund. 1777.—[More recently, *F. Freind*, who placed the primary action in the marrow, which becoming diseased and enlarged, separates the outer lamella, and distends the periosteum with pain and swelling. — *Monro* primus *Cheselden*, and others, held the same opinion. — *Bromfield* thought it an abscess in the marrow; v. his Surgical Observations and Cases, Vol. II. p. 20—22. 8vo. London, 1737; and *Warner*, that it originated in the marrow and vessels; v. his Cases in Surgery, p. 322. 8vo. London, 1760.—*Richerand* considers spina ventosa as a variety of osteosarcoma, and that it is the simple scrofulous swelling of the articular extremities of the phalanges, the membrane lining the spongy cells of which becoming thick, inflamed, ulcerated, and putting forth more or less abundant vegetations. Further, that it does not differ from suppurating exostosis or caries, except in the excessive swelling of the bony substance and the enormous size which the articular extremities of bones acquire; v. his Nosographie Chirurgicale, Vol. III.

p. 120. 8vo. Paris, 1815.—*Scarpa* holds the same opinion; v. his work De Anatome et Pathologia Ossium, p. 76—78. T.]

(7*) [This is denied by *Craigie;* he says, that "Spina ventosa never occurs in a bone with a distinct medullary canal, unless at the epiphyses where the structure is cancellated." And that the true agent of the process is the vascular medullary web, especially of the epiphyses; v. his Elements, p. 568—572. T.]

§ 117.

Another common consequence of inflammation is MORTIFICATION OF BONE, *necrosis, osteonecrosis, osteogangrena,*[1] answering to the gangrene of soft parts, but proportionally more frequent and of a more favourable kind than that. Mortification of bone may indeed occur in all parts of the skeleton, although it especially attacks the hard bones,[2] and is always succeeded by a SEPARATION, *exfoliatio,*[3] of the dead portions of bone from the living.[3*] According to the state of the bone attacked as well as the causal proportions, mortification of bone exhibits various differences. If a part of the body be completely affected by gangrene, the bones found therein become dead, spongy, light, frangible, and of a blackish brown colour.[4] In other cases, when scorbutic ulceration and hospital gangrene render the bones in the neighbourhood necrotic, so with similar discoloration they become softer and more soluble; in the common cases of necrosis, on the contrary, the dead bone is dry, rough, very deficient in jelly, frequently porous, or as it were, externally corroded, and mostly snow white, but more rarely coloured by a blackish or brown pigment evolved in the body itself. Often is the necrosis connected with caries, or it is the consequence as well as the cause of the latter; in fracture also single portions of bone not unfrequently become necrotic, and are separated and thrown off by exfoliation.[5] Mortification sometimes occurs only in certain layers of bone, for instance, the external, *necrosis externa, superficialis,* or the internal, *necrosis interna, centralis;* sometimes the whole mass, *necrosis totalis.* The first usually arises from the EXPOSURE, *denudatio,* of bone, in consequence of the morbid destruction of the neighbouring fleshy parts, &c., and attacks a greater or less portion of the outer table of the bone, which, when it is separated, is thrown off by ulceration, and replaced by granulation.[5*] The *necrosis interna* occurs almost only in tubular and round bones,[6] the *necrosis totalis,* on the contrary, in all solid bones. The latter kind of bony mortification, especially in tubular bones,[7] exhibits the remarkable phenomenon, that before the dead piece of bone has been separated from the living part, there is poured out between the inflamed periosteum and dead bone a jelly-like mass, which

gradually hardens and becomes ossified, surrounds, like a sheath, *vagina seu capsula sequestralis*, the necrotic bone, which is then called a SEQUESTER, *sequestrum*;[8] at first is connected with it, subsequently separates from it, and is then lined internally by a delicate medullary membrane. In the midst of these bony sheaths are one or several holes, *foramina grandia* of Troja, *cloacæ*[9] of Weidmann, which running into the already existing sinuses of the soft parts, produce an outlet for the continually absorbed and diminished sequestrum, as well as for the secreted lymph and pus, and when this is effected, they become gradually closed up. In the *necrosis interna*, the process is exactly the same; but in this case, the jelly-like substance poured out beneath the periosteum is only connected with the remaining living circumference of the bone, which, in many cases, swells simultaneously, and becomes softish. Both in *necrosis totalis* and *interna*, as well as in the *externa*, if the dead piece of bone be of some thickness, the medullary cavity in tubular bones is usually closed up,[10] at least for a time, by the deposition of bony matter.

(1) By the ancients in part, *Caries sicca; Louis*, in Mém. de l'Acad. de Chir. Vol. V. first distinguished this disease by the name Necrosis. — *de Plouquet* Repert. Art. Ossis Necrosis.—*Reuss* Repert. Comm. Vol. XII. p. 246, and the above-mentioned writers, § 113, note 2; especially *Troja*, *Knox*, *Meding* and *Cortum*;—*Robert*, præs. *Chopart* De necrosi ossium Theses. Paris, 1776.—*David* Observations sur une maladie, connue sous le nom de Necrosis. Paris, 1782. —*Hirsch*, præs. *Metzger* D. de necrosi ossium. Regiomonti, 1791.—*Weidmann* De Necrosi ossium. fol. Francof. a. M. 1793, with engravings; and *ib.* Ueber den Missbrauch des glühenden Eisens um brandige Knochenstücke abzusondern, a. d. Lat. von *Jos.* und *K. Wenzel*, 4to. Frankf. a. M. 1801, with eight plates.—*Russel*, A practical Essay on a certain disease of the bones, termed Necrosis, Edinb. and London, 1794, with six plates.—*Macdonald* D. de Necrosi ac Callo. Edinb. 1799. — *Himly* Abhandlung über den Brand der harten und weichen Theile. 8vo. Gotting. 1800.—*Deleuze* D. sur la nécrose et la carie. 8vo. Paris, 1802.—*Birgelmann* De necrosi ossium. Rudolst. 1804.—*Béclard* in Bullet. de la Fac. de Médec. de Paris, 1815, p. 427.—*Whately*, Practical observations on necrosis of the tibia. London, 1815.—*Blaise* Essai sur la nécrose. 4to. Paris, 1815. — *Lannes* D. sur la nécrose en général. 4to. Paris, 1815. — *Cullerier* Observations sur des nécroses du crane, etc. in Annuaire méd. chir. des Hôpit. et Hosp. Paris, 1819, p. 437.—*Wissmann* D. s. observationes de rite cognoscendis et curandis nudatione, carie et necrosi ossium. Halæ, 1820.—*Hennen* D. de ossium necrosi. Edinb. 1821.—*Kleemann* D. de ossium necrosi. 8vo. Berol. 1821.—*Flecchia* Sulla necrosi e sopra un raro osseo processo, in *Omodei's* Annali univers. di Medic. 1821, Vol. XVII.—*Borgh* 1te Verhandling over de necrosis gevolget van eenige Waarnemingen. 8vo. Groeningen, 1822, with plates.—*Weiglein* D. de necrosi. 8vo. Wien. 1824.—*J. Russel* in Trans. of the med. chir. Soc. of Edinb. 1824. No. 3.—*Richter* Die necrose, pathol. und therapeut. gewürdigt. 8vo. Berlin, 1826, and in *v. Graefe's* and *v. Walther's* Journ. f. Chir. Vol. VII. and VIII.—*Rudolph* D. de necrosi. 8vo. Berol. 1827.—*P. Hindernacht* Ueber die Erkentniss und die Behandl. des Knockenbrandes. 8vo. Würzb. 1827.

(2) Especially the shin, upper arm, and thigh-bones, the extremities of which it however spares; the lower jaw, and in syphilitic persons, the flat skull-bones. [Hard bones and hard parts of soft bones are found to exfoliate most readily,

this depending on the hard becoming dead most readily, from the fewer vessels in them; so that it is almost impossible to lay a hard bone bare without exfoliation being the consequence. *J. Hunter*, MSS. T.]

(3) SCALING, when sometimes the separate layers of the bones are thrown off like leaves.—*Exfoliatio sensibilis* and *insensibilis*, if the smaller pieces of bone thrown off are entirely absorbed or evacuated with the pus.—*Reuss* Repert. Comment. Vol. XIV. p. 251.—*Boulay* D. sur l'exfoliation des os. 4to. Paris, 1814.—*Menegazzi*, in *Brera's* Giorn. di Med. prat. Vol. I. Part I. gives a very remarkable instance of exfoliation on several parts.

(3*) [When a piece of bone becomes dead, it nevertheless adheres to the living part by attraction of cohesion, but it acts as an extraneous body would do, by stimulating it. In consequence of this stimulus, the surrounding living bone becomes inflamed and more vascular than before, the surrounding parts also inflame, and often take on the ossific disposition to a great extent; the earthy part of the bone is next absorbed, but the dead bone still adheres to the living by the animal substance of the bone; the next process then is the absorption of this animal substance; the absorption begins at the circumference and is continued to the centre; next the granulations arise (beginning at the circumference before it is entirely absorbed at the centre) from the living surface between the living and the dead bone, and the latter is pushed off. *J. Hunter.* MSS. T.]

(4) So that the whole limb may be separated. Compare § 62, note 2. A rare instance of loss of the thigh-bone is given by *Desessartz* in Mém. de l'Instit. nat. Ann. IV. Vol. I.—In the Anatomical Museum of the Joseph Academy at Vienna, I saw four such feet, and a fifth in the Anat. Mus. of the University there.

(5) The so-called secondary splinters.

(5*) [The dead bone is sometimes confined by the granulations extending over the edges of it and becoming ossified; if the parts so circumstanced are left to themselves, the same process will happen as in cases of other extraneous bodies, &c. the pressure producing ulceration. *J. Hunter*, MSS. T.]

(6) *Weidmann*, De necrosi ossium, p. 94, however, gives an instance of it on the hip-bone.

(7) Among the flat bones this kind of regeneration has been only observed in the blade-bone. v. further, § 140; the necrotic bones of the skull, as they are generally reproduced, effect this by granulations from the edges and from the dura mater. No instance of the round bones is known, except the heel-bone belonging to the Museum at Kiel, in which, however, the containing *vagina sequestralis* appears to be the shell of the old bone. Compare *Seidel* Index Musei anatomici Kiliensis. 4to. Kiliæ, 1818. No. 27, p. 22.

(8) Sc. Os.—The size and form of such sequestra vary exceedingly; sometimes they form a complete tube, sometimes merely a part; in internal necrosis both their surfaces are rough, but in complete necrosis the external is usually smooth.

(9) Usually we find only single cloacæ, but *Köhler* saw sixteen; v. Experimenta circa regenerationem ossium, No. 146, p. 45; on a tibia in the Anatomical Museum at Griefswald, I counted as many as thirty cloacæ. Disputes upon the cause of their origin. According to *Meding* and *Cortum*, birds seem to form no cloacæ.

(10) Here belongs also the case described by *Munk af Rosenschöld*, which is not very well known to me; v. D. resp. *Rabben*, de formatione novi ossis in cavamine tibiæ, exemplo comprobata. 4to. Lund. 1814.

§ 118.

Besides caries and mortification of bone which are the most common consequences of bony inflammation, the latter particularly, if it take on the chronic form and depend upon certain dyscracies and general diseases, produces some very striking

vices of texture. To these belong EROSION, INCREASED DEPOSITION OF LIME, AND THE CANCEROUS KIND OF BONY DISEASES.

First, as to EROSION, *erosio*, Ἀναβρωσις,[1] this is a partial destruction of a bone by increased absorption, which is of an inflammatory nature, and is often very distinctly produced by the increased activity of the numerous veins of the bone. It differs from caries, to which it often otherwise is very similar, in being unaccompanied by suppuration, and usually also without discoloration; from tabes ossium, on the contrary, by its inflammatory nature, and inasmuch as it not merely attacks the diploe, but also the external table of the bone. The erosion then is sometimes INTERNAL, sometimes EXTERNAL; the former is commonly the consequence of *scrofula protracta*, syphilis, cancer, and other general cachexiæ, in which oftentimes a morbid irritation and inflammatory condition of the bone is produced; the lime is then gradually removed, the diploe more or less destroyed,[2] and the bones, often quite soft, are mostly in the commencement filled with hard marrow, in which, as in the remaining bony substance, are seen many expanded tortuous veins. If the weakness of the organism increase, so that at last the jelly and hard fat of the bone are consumed, in their place is deposited lymph, which is often bloody, or a thinnish fluid-like marrow, and thus the brittleness of the bone, *fragilitas vitrea*, is produced. In rare cases this internal erosion arises from the morbid activity of the blood-vessels, and there is found, instead of the absorbed bony tissue, a greater or less collection of blood, mostly coagulated, but sometimes also fluid, which partially destroys, but always very much expands, the outer walls of the bone, and thus produces true BLOODY TUMOURS, *tumores sanguinei*, of bones. In most instances this disease is, as it were, a VARICOSITY OF THE BONE, and we then find at death, a thin half-coagulated blood collected in the cells of the bony tumour and in the veins, which are here and there enlarged and knotty.[3] More rarely are these bloody swellings of bone of an ANEURYSMAL NATURE, present during life some pulsation, and in their interior, the coagulated fibrous part of the blood partially mingled with cruor in large cells and cavities, and the distinct termination of a quantity of fine arterial branches in the cells.[4] Just as common as the internal is the EXTERNAL EROSION, which originates in a certain inflammatory irritation of the surface of the bone from disease of the soft parts and periosteum lying upon it, but especially from continued pressure, from effused blood,[5] and tumours of various kinds, more particularly aneurysmal, fungous, and scrofulous

tumours, which run into softening on the surface of the bone. At first the bone is more or less rough, often marked with deep lines, the indentations of the expanded blood-vessels, or perforated at several points, as if it were absorbed; the outer walls of the bone are gradually destroyed, together with more or less of the diploe; and flat bones, for instance, the bones of the skull, and the breast bone, are not unfrequently completely perforated.

(1) It is commonly held by some persons to be the same as consumption of bone, *tabes ossium*, (compare § 107,) and is besides often very similar to, and even connected with it, although I think it may be distinguished not improperly from that disease. In reference to its literature, v. above, § 107, note 5; *Scarpa* in D. Mémoir. de la Soc. Roy. de Méd. 1780 and 81, Vol. IV. first distinguished the erosion in aneurysm from caries; *Cumin* first employed the word anabrosis in the Edinb. med. and surgical Journ. 1825.

(2) In the long tubular bones, the shell only remains, hardly a line thick; *Saillant* in Histoire de la Soc. Roy. de Médecine, 1786, p. 98, calls this *goutte medullaire*. Compare *Lobstein* Compte rendu, &c. p. 26; many such preparations are found in the Bresl. Anat. Mus. I have several times seen on the flat bones of the skull, pelvis, and shoulder-blades roundish pits, closed on both sides merely with periosteum, and containing a thin jelly; v. my Verzeichniss, u. s. w. No. 3522, 3649, 3925.—Selt. Beob. Part II. p. 11, No. 4; a good engraving is given by *Copeland* in his Observations on the symptoms and treatment of diseased Spine. 8vo. London, 1815.

(3) To these belong in part *Boyer's tumeurs fongueuses sanguines accidentelles.* v. Traité des maladies chirurgicales. 2d edit. Paris, 1818. Vol. II. p. 318.—*Fabriz Hildanus* Observat. Cent. II. Obs. 35, p. 110.—*Else*, Medic. Observat. and Enquiries. Vol. III. p. 169. Lond. 1769.—*Perc. Pott*, Chirurgical Works.—*Lassus* Pathol. chirurg. Vol. I. p. 489. — *Pelletan* Clinique chirurg. Vol. II. p. 14, Obs. 3. — *Breschet* Sur des tumeurs sanguines, etc. in Répert. gén. d'Anatom. et de Phys. pathol. 1826. Vol. II. No. 4, p. 263. Several of the preceding observations, however, describe cases of osteosarcom, in which much blood is found in the tumour. I have seen two cases of this kind in the lower jaw and on the shin-bone.

(4) *Pearson* Medic. Communicat. Vol. XI. p. 95. Lond. 1790.—*Scarpa* Sull, Aneurysma. Obs. 10.—*Lallemand* in Répert. gén. d'Anat. et de Phys. pathologiques, 1826, Vol. II. No. 4, p. 253.—*Breschet*, p. 280, in which are described three cases from *Dupuytren's* practice. Simultaneously also with osteosarcom we find small aneurysms; v. my Selt. Beob. Part II. p. 30.—*Scarpa*, p. 103.

(5) *Hunter* in Med. and Surg. Observations and Inquiries, &c. Vol. I.—*Thomas* in Edinb. med. Comment. Vol. VI. p. 75.

§ 119.

The INCREASED DEPOSITION OF BONY MATTER, *hyperostosis*,[1] consequent on the inflamed state of bones, appears under a twofold form, viz. as INTERNAL and EXTERNAL. The former indeed, in a milder degree, is the usual and best consequence even of the least important inflammation of bone, which on account of its hardness, does not appear capable of being resolved in a similar manner to inflammation of soft parts. The necessary consequence of this deposition of bony matter in the diploe is naturally, INCREASED WEIGHT AND SOLIDITY of the bones. The more frequently the inflammatory

condition recurs, or in other cases the longer the morbid irritation favours the deposition of lime, the more is the weight and solidity increased; so that such bones not unfrequently assume an ivory-like state, and if they be tubular, their medullary cavities are also filled with bony substance.[2] This bony deposition, however, is always favourable, and is not, as to its consequences, to be compared with the induration of soft parts; it is on the contrary a kind of cure for many diseases of bone, or at least an attempt thereat. We therefore often find a bone consolidated in the neighbourhood of caries and spina ventosa; frequently the venereal disease,[3] and malignant gout, produce great weight and solidity of the bones; sometimes also the looseness of bone from rickets, or other ill-defined and mixed morbid causes, are as it were cured by the increased deposition of lime, and thus distinct bony tumours, with accompanying unnatural solidity, density, and weight, are produced. We most commonly observe this latter disease, which in a more restricted sense we call hyperostosis, on the head,[4] although sometimes also on other bones, and even on several parts of the skeleton at the same time.[5] More frequent than on the interior, is the deposition of lime ON THE SURFACE OF THE BONE, or the EXTERNAL hyperostosis; for the most part also, as is natural, is it more injurious in its consequences than the former. The inflammatory states of the periosteum, and the outer table of the bone, produced partly by mechanical, and partly by internal causes,[6] are the usual origins of this disease. Sometimes the lime is deposited in the loosened periosteum, which then becomes cartilaginous and bony, in leaf-like patches,[7] or it assumes the form of flattened rounded tumours of cartilage, *gummata*,[8] or of NODES, *nodi*. If the superfluous bony mass be situated on the bone itself, we call it, when it forms a local and defined prominence, a BONY TUMOUR, *exostosis*,[9] but if it be very large and less distinctly defined, a BONY GROWTH, *luxuratio ossium;* the bony tumours which occur in cavities, for instance, in the skull, the orbit, the pelvis, the joints, we distinguish by the name *enostosis;* sometimes in the skull an exostosis is produced simultaneously on the external and internal surface. The bones of the skull, as well as the tubular bones, and of these, the thigh and shin bone, most commonly present exostosis; next them perhaps, the vertebræ and the pelvis; still however they can be produced on any bone,[10] and in rare cases on many parts of the skeleton simultaneously.[11] They are also frequently found in great number in the neighbourhood of bony parts which have been affected with long-continued caries[12] and spina ventosa.[13] Their form and size assume an endless

variety; we observe them flat, globular, gibbous, tooth-like, styliform, broken as it were at both ends and arched in the middle,[14] sometimes they attain the size of a child's head, and even that of man. But even more considerably does the texture of these bony tumours vary; frequently are they of a mixed structure; they assume, however, three principal forms: they consist indeed often of a more or less close, even ivory-like healthy bony mass, which as it were exudes from the surface of the bone, and there coagulates;[15] in this case the outer layer of the bone only appears slightly changed in its structure; the spiny and tooth-like exostoses also, as in spina ventosa, appear to be very hard and close. In other instances, from the loosened surface of the bone, innumerable delicate bony fibres, standing close to each other in a perpendicular or oblique direction, shoot up in the inflamed and spongy-like loosened periosteum; these bony fibres are of the length of an inch or thereabout, are harder and closer at their base, and at their further end soft and cartilaginous, and penetrate into the cellular tissue of the loosened periosteum, which still remaining externally unbroken, dips deeply inwards between the bony fibres, surrounding them like sheaths. Lastly, in other cases, by the partial expansion of the bone from within, the contained exostosis has its interior loose, cellular, very vascular, and its cavities filled with very different substances, which vary in consistence from lymph to soft cartilage; large tumours of this kind are particularly common in the lower jaw,[16] and still more in the bones of the hand,[17] containing a light coloured jelly in mixed cells of bony fibres and cartilaginous membranes. These cellular exostoses become larger than the other kinds, easily inflame, and run into suppuration, or are converted, by increase of the cellular tissue of their cells and loosening of the periosteum, into large tumours, the base of which consists of thread-like, tooth-like, or leaf-like bony masses. Very hard and close exostoses are in rare instances separated by necrosis.[18]

(1) *Nesse-Hill* Sur les maladies des os par secretion superflué, &c. in Journ. de Médec. continué. Vol. VI. p. 122.

(2) *van der Haar* in Verhandelingen van het Maatsch. te Haarlem. Decl. XV. *Boyer*, Traité de malad. chir. Vol. III. p. 547, properly considers this to occur but rarely. Compare *Pitet* in Bulletin de la Société de Médec. An. XIII. and XIV. Several instances occur in the Bresl. Mus; v. my Verzeichniss, u. s. w. No. 3510, 3514.—*Lobstein* Compte rendu, &c. p. 25.

(3) *Brugmanns* in *van Maanen* D. de absorptione solidorum, etc. p. 93. My Verzeichniss, No. 167, 3091, 3092.

(4) *Malpighi* Op. posth. ed. Lond. 1697, p. 49, from the collection of the Duke of Modena.—*Ribelt* in Mém. présent, Vol. II. p. 336, (it weighed eight pounds and half an ounce;) a skull which *Jussieu* possessed at Paris, described and engraved in the Oryctologie par MM. les Sav. de Londres et Montpellier,

1755, by *Jadelot* Description anatom. d'une tête humaine extraordinaire, etc. 8vo. Paris, 1799, with engravings.—*Jourdain* Traité des depôts dans le sinus; Maxillaire et des Caries, etc. 12mo. Paris, 1761.—Selt. Beob. u.s.w. Vol. II. p. 1, No. 1.—*Ilg* Einige anatomische Beob. u.s.w. p. 10, Prag. 1821, pl. 2 and 3.—*von Soemmerring* in *Ballenstedt's* and *Krüger's* Archiv für die neuesten Entdeckungen aus der Urwelt. Vol. III. Part I. p. 25.—*Spurzheim* possessed a similar skull; v. *Kilian* Anat. Untersuchungen über das neunte Nervenpaar. p. 133, note 10. I saw a similar skull in the Cabinet of Natural History at Darmstadt, (*Bojanus* has described it in *v. Froriep's* Notizen, Sept. 1826, Vol. XV. No. 9, p. 129.) in *Brookes's* collection in London, in *Vrolick's* at Amsterdam, at Copenhagen in the Surgical Academy, in the Anat. Pathol. Mus. at Vienna (when fresh almost seven pounds in weight,) and the commencement of this disease on a skull in Prof. *Huth's* at Frankfort, afterwards at Charkow (*v. Soemmerring's* mention of this case was probably derived from my verbal explanation,) and died at Dorpat. Sometimes it occurs only on certain parts of the skull, v. *Sandifort's* Mus. Anat. Vol. II. plate 13, fig 3, 4, 5.—*v. Soemmerring* mentions such a case in his collection.—*v. Loder* of a parietal bone; v. Index præparator. Part II. p. 9. I also saw this disease on the forehead of a child with a large tumour on the upper jaw, of an osteosarcomatous nature, in the Museum at Freyburg in Brisgow.

(5) On almost all the bones of one man; *Noel* in *Roux* Journ. de Médec. 1779. Maerz. p. 225.—*Saucerotte* in Mémor. de l'Institut nat. Scienc. physic. Vol. II. p. 114. In *Soemmerring's* collection I saw this disease on two fowls, and also in the Anat. Mus. at Bonn, in the skeleton of a hen; perhaps also here belong the fowls' bones described by *Sandifort*, Mus. Anat. Vol. III. p. 275, No 911—915.

(6) Especially syphilis, gout, and mixed cachexiæ, which are distinguished with difficulty.

(7) OSSIFICATION OF THE PERIOSTEUM is indeed a rare disease, though I have seen it several times on the bony stump after amputation, and also on other parts; sometimes the outer layer only is ossified, and then forms a rough thin bony plate, running parallel to, but at about half a line's distance from, the bone itself, and which is only attached to it at certain parts by bony fibres; I once saw this on the outer surface of the hip-bone. Upon ossification of the periosteum, v. *J. Howship*, in Med. Chir. Trans. Vol. VIII. p. 70.—*Boyer* in Archives générales de Médecine, Nov. 1823.

(8) *Boyer*, Traité des maladies chirug. 2d edit. Vol. III. p. 564, calls it *Periostosis.*

(9) *Bidloo* De exostosi in Op. omn. p. 202, tab. 2. Lug. Bat. 1715.—*Juncker* præs. *Ludwig* D. de exostosibus. 4to. Halæ, 1756.—*Houstet* in Mém de l'Acad. de Chir. Vol. III. No. 7, p. 130.—*Saldana* D. de Exostosi. Traj. ad Rh. 1762.—*Allan* præs. *Dumont* De exostosi. Theses anat. chir. 4to. Paris, 1770.—*Delort* præs. *Suë* De exostosi. 4to. Paris, 1774.—*Fayolle* De exostosi Monspel. 1774.—*Sigwart* D. exostosis exemplo rariori illustrata. Tübing. 1781.—*Morgagni* De sed. et caus. morbor. Ep. L. Art. 56, et seq.—*Ramonet* D. sur les exostoses. 8vo. Paris. An. XI.—*Millière* D. sur les exostoses. 4to. Paris, 1814.—*Cullerier* in Dict. des Sc. médic. Art. Exostose, Vol. XIV. p. 218.—*Howship*, p. 55.—*A. Cooper* on exostosis in his and *Travers's* Surgic. Essays, Vol. I. 2d edit. 1818.—*Bail* D. de ossium luxuriatione. 4to. Berol. 1820, with lithographic engravings.—*Busch* in Petersb. vermischten Abhandl. u. s. w. Part I. p. 61, pl. 2. Petersb. 1821.—*Westberg* in Svenska Läkare-Sällskapets Handlingar. Vol. IX. 1823.—*Gibson* in Philadelphia Journ. of the medical and physical Sciences, ed. by *Chapman*. Vol. II. No. 1, p. 121.—*Starck;* v. § 116, note 6.—*Sandifort* gives good engravings of exostosis in his Mus. Anat. tab. 87, 88, 102.—In brutes exostoses are not uncommon; to wit, on the spine in horses, on the foot in spavin and ringbone: the latter disease is sometimes hereditary and congenital;—all the progeny of a bull with an exostosis on the head had this vice. See *Rudolphi* Bemerkungen auf einer Reise, u. s. w. Vol. I. p. 75;—*Boyer* describes, at p. 600, a case of hereditary exostosis in the human subject.

(10) *Gibson* thought it did not occur on the hand and finger bones; this however is incorrect, for many such instances have been seen; note 17.—In Bresl.

Mus. there is (No. 8090) an exostosis on the first phalanx of a finger, as big as a walnut, hard and close—I have seen a somewhat smaller one on a phalanx of a finger in the Anat. Mus. at Freyburg.

(11) Compare, for instance, several of the above described cases, § 109, note 11, in general anchylosis; further *Trafvenfeldt*, in Ars. Berättelsa om Svenska Läkare Sällskapets Arbeten. p. 14. Stockh. 1815.—Ekström, *ib.* 1826.—I saw two very striking instances in the Anat. Pathol. Mus. at Vienna, and in the Anat. Mus. at Strasburg. *Meckel*, in his Pathol. Anat. Vol. II. Part I. p. 274, has described large fibrous exostoses on the skull and pelvis of an individual.

(12) In the Anat. Mus. at Zurich I saw several exostoses as big as one's fist, on the thigh and shin bone in the neighbourhood of caries.

(13) *Cumin* calls it caries ossificans.

(14) For instance, my Verzeichn. No. 3854.

(15) Cooper's periosteal and cartilaginous exostosis, as it is between the periosteum and bone, is at first formed of a cartilaginous mass.

(16) A case of this kind has, without any reason, been named Hydrexostosis; see *Noack* D. de hydrexostosi et hæmatexostosi. 8vo. Vratisl. 1824.

(17) They usually occur in children, especially in those of a rickety disposition, sometimes however also in adults; in both cases, often from mechanical influence, they often exist for ten or twenty years without actual inconvenience beyond their size and weight. — *Bidloo* Op. omnia, p. 205, with engravings. Plate I.—*Mery* in Mém. de l'Acad. des Sc. 1720, p. 447, tab. 12—15.—*Lentin* in *Loder's* Journ. f. Chir. Vol. I. p. 60.—*Meckel* Pathol. Anat. Vol. II. Part I. p. 272.—*Dupuytren* in Dict. des Sc. medic. Vol. XXXIII. p. 8.—*von Klein* in *v. Graefe's* and *v Walther's* Journ. f. Chir. Vol. III. Part III. p. 403, pl. 3, fig. 4. —*Souvestre* in Journ compl. du Dict. des Sc. médic. Vol. VI. p. 276.—*Thurn* in *Harless* Rhein. Jahrb. für Med. u. Chir. Vol. VI. Part I. p. 199.—*Edholm* and *Gadelius* in Svenska Läkare-Sällsk. Handl. Vol. I. Part II. p. 100 ff. and p. 109 (the latter case on the foot);—*Wahlberg*, *ib.* Vol. III. p. 127, pl. 2.—*Bail*, p. 16, fig. 4. — *Hesselbach* Beschreib. der pathol. Präparate zu Würzburg. p. 307, No. 127, 128, 481. — Myself in Selt. Beob. Part II. p. 22, No. 10, tab. 1, fig. 1.—I lately saw a boy, about ten years old, on whose left hand and foot there were many and large gibbous swellings of this kind.

(18) *Boyer*, Vol. III. p. 554. In the Anat. Mus. of *Meckel*, at Halle, I saw an ivory-like exostosis, as large as one's fist, which had spontaneously dropped from the nostrils of a horse.

§ 120.

The last and most malignant kind of vice of texture in bones, is the BONE FLESHY SWELLING, OR BONY CANCER, *osteosarcoma*, *osteosteatoma*, *fungus*, and *cancer ossium*.[1] as it is called. This disease, so far as the structure of bone permits, resembles the sarcomatous and carsinomatous diseases of soft parts in their various and varying forms, together with their distinct morbid disposition,[2] their easy recurrence, their existence in the middle and later periods of life, and their common malignity. Sometimes external mechanical influences operate as occasional causes for the production of osteosarcom. This disease most usually occurs on the bones of the head, of the pelvis, and in the long tubular bones: but in animals it is as rarely seen as cancer in the soft parts. The original seat of the disease is usually the internal bony tissue, and the periosteum at first extends unchanged over the bony tumour;

although in rare cases, tumours and fungosities of similar character are primarily produced in the periosteum.[3] With regard to the structure of the osteosarcom, this is somewhat different, according as the bone is more delicate and spongy,[4] and as the disease assumes more the form of sarcom, medullary sarcom, or cancer; in general however, the tumour at first consists (although afterwards the bone be more or less softened and swollen) of a tolerably homogeneous, greyish-white, unvascular mass, intermixed with bony points, which almost resembles cartilage, and consists of a quantity of sinewy fibres, more or less firmly consolidated with albumen. The tissue gradually becomes loosened, and forms cells of a greater or less size, which are filled with a light-coloured jelly; an inflammatory excitement now takes place in the swelling, the thin cellular tissue which lines the cells becomes thickened, and secretes a mishapen mass consisting of albumen, which is sometimes hard, sometimes soft and resembles brain, or there is produced within them a cellular tissue richly loaded with albumen; the blood-vessels also gradually enlarge in the periosteum, as well also as in the interior of the swelling, and small or large cavities are commonly formed, which in rare cases are filled with arterial, but more usually with venous blood,[5] and into the brain-like substance blood is also effused. At the same time innumerable bony fibres or plates commonly project from the interior of the bone outwards, and perforate the tumour in various directions, which becoming softer and larger, is finally united at certain spots with the much expanded fleshy and membranous parts lying upon it, perforates these, and allows the escape of a more or less growing fungus.

(1) Also exostosis fungosa, carnosa, carcinomatosa, &c. There is a great confusion among authors, especially about this disease, as spina ventosa, and particularly cellular exostosis, is often confounded with osteosarcom. With reference to single cases, v. *du Plouquet* Repertor. Art. Osteostéatoma; also the old observations of *Severinus* de Abscondita abscessuum natura, L. B. 1724, p. 207, with engravings.—*Duverney* in Abhandl. über Knochenkrankheiten.—*Amyaud* in Phil. Transact. 1708, p. 170, &c. — *Hundertmark* præs. *Tittmann* D. s. osteosteatomatis casum rariorem. Lips. 1757.—*Herrmann* D. de osteosteatomate. 4to. Lips. 1767, with coloured plates.—*A. Murray*, D. de osteosteatomate. Upsal, 1780. — *Gruner* D. Historia osteosteatomatis feliciter curati. Jenæ, 1781. — *Ludwig* Icones anat. pathol. tab. 1, fig. 1. tab. 2, f. on the pelvis.—*Howship*, p. 64.—*Rust* Magazin f. die gesammte Heilk. Vol. I. Part I. p. 60, tab. 1, on the upper arm.—Myself in Selt. Beob. Vol. I. p. 83, No. 41, tab. 2, on the upper arm, and *ib.* Vol. II. p. 23, ff. — *Bang* in Actis nov. reg. Soc. med. Vol. I. No. 8. Havniens. 1818, on the pelvis. — *Behr* in Recueil de Mém. de Méd. Chir. et Pharm. milit. par *Fournier-Bescay*. Vol. XII. No. 10, on the arm. — *v. Walther* in his and *v. Graefe's* Journ. der Chir. &c. Vol. V. Part II. p. 283, on the hand and shin-bone. — *Westring* in Svenska Läkare-Sällskap. Handlingar. Vol. IX. p. 136, on the pelvis and shin-bone. — *Cutting*

in Med. Chir. Transact. Vol. II. No. 24, on the upper arm.—*Gibson* in *Chapman's* Philad. Journ. of med. and physical Science, Vol. III. No. 1. — *Boyer* Traité des Malad. chir. 2d edit. Vol. III. p. 600, on the thigh and pelvis. — *Baldy* in *Fothergill's* Lond. med. phys. Journ. Vol. XL. Nov. 1818, on the upper arm bone.—*Cerutti* Beschreib. der pathol. Präparate des anat. Theat. zu Leips. No. 332, p. 68, on the upper arm bone.—*Pech* Osteosarcoma, ejusque speciei insignis descriptio, etc. 4to. Wirceb. 1819, with three engravings, on the face.—*Carmichael* in Irish Transact. of the Association, &c. Vol. III. Dublin, 1820, with engravings, on the thigh. — *Williams* in Lond. med. Repository, Vol. XVII. No. 99, p. 204, March, 1822, on the shin bone. — *Dietel* D. de osteosteatomate. 4to. Lips. 1822, with three engravings, on the thigh. — *Lobstein* Compte rendu, etc. p. 32, Strasb. 1824, on the splint and shin bone, also the chemical analysis of the tumour.—*Crampton* in Dublin Hospital Reports, Vol. IV. p. 537.—*Kolsch* Ein Fall vom Knochenkrebs, nebst einigen Bemerkungen. Inaugural dissertation. 8vo. Würzb. 1826, with one engraving. — *Graff* in *v. Graefe's* and *v. Walther's* Journ. d. Chir. Vol. X. Part I. p. 76, pl. 2, fig 4 and 5, on the skull.—On osteosarcom of the jaws and their joints, see those parts.—*Koschate* Observationes nonnullæ circa Osteosarcoseos naturam et indolem adnexis tribus hujus morbi historiis. 8vo. Vratisl. 1826.—*J. F. Bonfils* Description succinte d'une Maladie grave et rare de la partie superieur de l'humerus, etc. Nancy, 1817, with engravings.—*K. E. Donat* D. de fractura cum Osteomalacia fungoque carnosa complicata, ex medulla tibiæ exeunte. Halæ, 1828.

(2) Compare my Selt. Beob. Vol. II. p. 23.—*Gibson*, in which on several parts at the same time, or recurring and connected with a cancerous state of other parts; *Pott* in Phil. Transact. No. 459. — *Voigtel* Pathol. Anat. Vol. I. p. 127.—*Meckel* Pathol. Anat. Vol. II. Part I. p. 274, ff.— *Heymann* in *Harless* Rhein. Jahrb. Vol. II. Part I. p. 74. — *M'Clellan* in Americ. medic. Recorder. Vol. V. No. 4. New-York, Oct. 1822.—*v. Walther.*—*Salomon* in Verm. Abhandl. a. d. Gebiete der Heilk. 3d edit. p. 237. Petersb. 1825.—*Bonfils* in Journ. gén. de Médec. 8vo. 1826.

(3) Sometimes as large roundish loosely attached swellings, more rarely as fungous growths, &c. *v. Walther* in der Salzb. med. chir. Zeitung, p. 185. Feb. 1813, on the collar bone of a woman with fungus of the dura mater; sometimes large sarcoms in the soft structures adhere to the neighbouring periosteum of a bone, and seem then to spring from it.—*Voigtel*, p. 124, improperly considers the periosteum as the usual seat of osteosarcom.

(4) In this the structure of the tumour is, from the commencement, more loose and cellular.

(5) From these large varicose cavities, the blood starts sometimes in great quantity during operations. v. *Rust* and myself.

§ 121.

Finally, we observe also VICES OF THE CONTENTS of bones. To these first belong the morbid changes of the MARROW;[1] this in cachetic men and animals is even entirely deficient, or at least it exists only in small quantity; in other instances, on the contrary, it is too abundant, and pervades the usually dry bony parts. Its consistence varies not less from its natural condition, it is sometimes too hard, tallow-like, and even resembling waxy fat; but more commonly it is too thin and too much mingled with lymph. The latter is especially the case in rickets, scurvy, dropsy, and other cachexiæ. The marrow also exhibits numerous deviations in respect to colour, so that it may be too pale and completely white, or too deep yellow,

reddened by a large admixture of blood; and in carious and mortified bones, sometimes grey and discoloured.

DROPSY, of such kind as is met with in soft parts, cannot occur on account of the firm texture of the bone;[2] however, we sometimes find in dropsical persons, that the bony cells, instead of containing fat, are filled throughout with lymph-like fluid, and in rare cases, in dropsical children newly born, we observe a turbid serum effused between the bones and their investing periosteum;[3] there have been also observed in some instances in the cavities of the tubular bones, WATERY BLADDERS, or HYDATIDS;[4] PUS and ICHOR often fill the spongy tissue of inflamed and carious bones; more rarely we find that blood is poured out in their cellular tissue,[5] without any distinct change of structure in the bones; we more frequently observe, in the swellings of the heads of new-born children, or after contusions, &c., if the periosteum be partially separated from the bone, blood effused between them. Lastly, in the bones we sometimes meet with entirely extraneous bodies, which have entered from the surface, for instance, MERCURY,[6] which in various forms has been taken up by the skin or by the mouth, and received into the body; SULPHUR in labourers in sulphur mines;[7] and especially SHOT, which are generally thrown out by caries or mortification, but sometimes remain, and are firmly connected to the bone for a long time, and even throughout life.[8]

(1) *Moignon* Tentamen de medullæ morbis. 8vo. Paris Ann. III.

(2) The disease described by *v. Wy* in Heelkundig. Mengelstoff, Vol. II. Part I. 1785, under the name *Hydrosteon*, does not appear to belong to this, but to rickety loosening.

(3) I have seen three or four dead born, though never putrid dropsical children.—A similar instance, with loss of the epiphyses, was seen by *Clouquet*, v. *Leroux* Journ. d. Méd. chir. et Pharm. Vol. XXXIX. Aug.

(4) In a bony swelling, *Keate*, in Lond. med. chir. Transact. Vol. V.; and *A. Cooper*, which latter preparation I saw in the Museum at St. Thomas's Hospital, London; in the cavity of the tibia, *Cullerier* in *Corvisart's* Journ. de Médec. Vol. XII. p. 125, Août, 1806. — *Webster* in New-England Journ. of Med. and Surgery, Vol. VIII. Boston, 1809.—A preparation of this kind is in the Hunterian Museum at Glasgow; and another, viz. a long watery cyst in the thigh-bone of an ox, in the Hunterian Museum in London, No. 521 of the patholog. series.—Many hydatids were found in the tibia, by *Wickham*, in London med. and physic. Journ. Jan. 1827, p. 530. [There is a preparation in the Mus. at St. Thomas's Hospital of hydatids in the spinal column; they are situated in the bodies of the eleventh and twelfth dorsal vertebræ, the greater part of which, together with the intervertebral substance, are absorbed; and the cavity thus formed communicates on the left side with a large bag full of hydatids, which resembles an incipient psoas abscess, and the spine is at this point curved forwards, as in scrofulous caries. It seems impossible to determine whether the hydatids were first formed in the bony, or in the ligamento-cartilaginous intervertebral substance; of that, however, between the two vertebræ, there is not the least trace, but the remainder of the bodies are filled with the little watery cysts. T.]

(5) I have seen this a few times on the skull bones of an adult, accompanying organic vice of the brain. v. Selt. Beobacht. Vol. II. p. 92, No. 3119, of Bresl. Mus.; in the skulls of birds which have been poisoned with opium, belladonna, and spirits, v. *Cuvier* s. Annales des Sc. naturelles, Vol. II. p. 428.

(6) v. *Fricke* Annalen des Hamburger Krankenhauses, u. s. w. Vol. I. p. 106. — *de Plouquet* Art. Mercurius, also *Lieutaud* Hist. anat. med. L. III. Sect. VIII. Obs. 558—562.—*Boneti* Sepulchret. anat. Vol. I. Obs. 114, p. 64.—*Hufeland's* Journ. f. pr. Heilk. 1821.—*Isenflamm* in *Augustin's* Neueste Entdeckungen, u. s. w. 1800, p. 375. — *Lobstein* Compte rendu, etc. p. 27.—Myself in Selt. Beob. Part II. No. 13, p. 36.—I also have observed a third instance. v. Verzeich. der anat. Präparatensammlung, u. s. w. No. 3019.

(7) *Reil* in *van Mons* Journ. de Chim. Vol. II. p. 105; compare *John's* Chem. Tabellen des Thierreichs, p. 44.

(8) Compare surgical writers, and *de Plouquet* Repertor. Art. Peregrina.—Gött. gel. Anzeiger, 1269, p. 202, a bullet 59 years in the skull. There are several instances in *Isenflamm* Anatom. Untersuchungen. 8vo. p. 36. Erlang. 1822—*Eck* D. de carie articulor. externa. p. 82. Berol. 1818.—*Grossheim* in *v. Graefe's* and *v. Walther's* Journ. f. Chir. Vol. X. Part I. p. 142, pl. 3, fig. 123. — *Sandifort* Mus. anat. Vol. III. p. 201, No. 336, a piece of lead in the collar-bone. On balls in elephant's teeth, v. the Teeth. In animals, enclosed balls and gunshots are not uncommon. I have found them in wolves, No. 3576 of Bresl. Mus.; in foxes, hares, and in the wing-bones of birds.

SECOND CHAPTER.

Of the Bones in Particular.

A.—OF THE BONES OF THE HEAD.[1]

§ 122.

In human monsters and in those of animals, the skull is frequently very deficient; this especially occurs in the anencephalous, of which the entire upper part of the skull is apt to be wanting.[2] But even in a well-formed skull, the number of bony pieces composing it often varies remarkably, inasmuch as, either certain bones, as a vice of formation, are deficient, and their place supplied by others which have become enlarged, or on the contrary, supernumerary bones exist in the different kinds of duplicature of the head. The number of bony pieces in the skull are most usually increased by the CONGENITAL SEPARATION of many bones into several pieces,[3] and by the SUTURAL BONES, *ossa suturarum.*[4] The latter most commonly in the lambdoidal, next in the coronal and squamous suture, vary in number from one to some hundreds; sometimes they are very symmetrical; and in more rare cases, are produced only on the outer or inner table of the bone. A single large bone of

consequence of wasting of the diploe in very old persons, and more rarely also in young people without any assignable cause.[20] Oftentimes certain spots only are so thin,[21] particularly when pressure has been continued on them for a long time. Very naturally connected with the irregular thinness of the skull, is that state in which it is not only very thin, but even partially UNOSSIFIED and MERELY MEMBRANOUS; in some cases this occurs to a great extent, more commonly only at certain spots, especially in dropsy of the head, rickets, and cretins.[22] The opposite vice, the abnormal THICKNESS of the skull,[23] is still more common, especially in persons who are much subject to congestion in the head, also for instance, in insane people,[24] and often attains such extent, that the bones of the skull become half an inch, or a whole inch thick; in this state, the structure of the bones is sometimes perfectly healthy, in other cases, especially in ricketty people, spongy, and light; in some instances, however, thick and heavy, almost like ivory.[25] Sometimes the skull is only so thick and tubercular at certain places.[26] This leads us to the BONY GROWTHS,[27] which we observe produced not merely on the outer or inner surface of the skull, but sometimes on both sides, and occasionally acquiring a very great size; in animals, such exostoses are frequently observed.[28] In epileptic and insane, and even in other persons not unfrequently, processes are found on the interior of the skull which are very prominent and sharp.[29] As to the CONNEXION of the separate bones of the skull, there is great deviation from the general rule, arising from diminution, increased strength, and irregular mass of their composition. The first vice exhibits itself in the long continued or permanent existence of such sutures which, as the frontal suture, and some sutures in animals, are naturally consolidated at an early period, and in the unusual congenital separation of certain bones of the skull into many pieces;[30] further, it is very common in dropsy of the head, in which congenitally or sometimes soon after birth, the bones of the head are more or less further apart from each other; this happens in more rare cases only in a single suture. Such broad membranous interspaces, sometimes in later years, become so filled up with a quantity of little sutural bones, that some and even all the sutures appear at once double.[31] Oftentimes we observe bones which have been for a long while united, separated from each other at their sutures,[32] by violent flow of blood to the brain, as well also as by collections of water, and tumours, &c. The other vice, the too firm connexion or anchylosis of the bones of the skull, is much more common, it occurs especially in the sagittal suture,

although also not rarely on other, and even on all the sutures of the skull at the same time; sometimes it exists only on the outer or inner surface, whilst on the opposite side the suture is still distinct, and can then only be properly considered as morbid, if it be observed previous to birth[33] or before the perfect development of the head.[34] Finally, the sutures of the head often appear so far irregular, as that they run obliquely or tortuously, have too few or too many, too small or too large teeth,[35] in some places are widened,[36] or become seam-like.[37] The CONTINUITY of the bones of the skull is frequently destroyed by mechanical influences; to these belong, the incised, penetrating,[38] and shot wounds, the splitting of the external and internal tables of the skull, the clefts or fissures, *fissuræ*,[39] which in consequence of the brittleness of the bones of the head often are very extensive and very numerous, sometimes run into the sutures and divide them, although not unfrequently their course is stopped by them; fissures occur either at the spot on which the blow is received or at some distance from it, producing *contrafissuræ;* fractures of bone with the loss of one or several pieces; the more or less deep indentations, *impressiones*, or depressions, *depressiones*, of the bony pieces connected with fracture, and the openings artificially made by the trephine, which are but rarely again filled up with bone. Similar apertures in the skull to those purposely made by the trephine, occur also not rarely from other causes,[40] viz. those which are congenital in hernia cerebri and dropsy of the brain, further, such as occur in caries, necrosis,[41] and by the erosion of encysted and scrofulous tumours,[42] fungus of the dura mater, aneurysm,[43] &c. Lastly, we must here mention the so-called *fungus cranii;*[44] this is a sarcom or medullary sarcom of the bones of the skull, in which a distinct tumour is produced often only on the external surface, or also at the same time on the internal surface, and sometimes becomes pretty large; it may run at last into a spongy growth. It usually occurs on the top of the skull, although also sometimes on its base, and then protrudes outwards through the usual openings at this part.[45]

(1) *Krebel* D. de anatomia pathologica ossium capitis. 8vo. Halæ, 1823.—Betrachtungen über die Ursachen und Verschiedenheiten der Missbildungen des Schädels und des Rückgrathes beim Foetus von *Dugés* in Revue médicale francaise et étrangère. Vol. X. p. 358.

(2) Good engravings in *E. Sandifort* Anatome infantis cerebro destituti. L. B. 1784, and in Mus. anat. Vol. II. tab. 35, fig. 2—5.—*Geoffroy* Anat. philosophique. Vol. I. Paris. 1822, pl. 1—3.—*J. F. Meckel* Descript. monstror. nonnullor. 4to. Lips. 1826, tab. 1.

(3) Generally the bony germs do not grow; sometimes also there is an anomalous growth.

(4) Intermedial bones, Ossa Wormiana, O. triquetra, &c.; v. *Bertin* Traité d'Ostéologie, Vol. II. p. 470; *Monro* in Edinb. med. Essays. Vol. V. No. 16, pl. 2.—*Sandifort* in Observ. anat. pathol. Lib. III. cap. 9, tab. 9, and Lib. IV. cap. 10, p. 136.—*Blumenbach's* Geschichte der Knochen.—*Meckel* Pathol. Anat. Vol. I. p. 313.—*Rottböll* in Skrif. det kiöbenhavnske Selsk. Nye Samml. Deel I. p. 249.—*Jung* Animadversiones quædam de ossibus generatim et in specie de ossibus raphogeminantibus, quæ vulgo ossa suturarum dicuntur. 4to. Basil. 1827, with figs.—My Verzeichniss, &c. No. 183—225; in animals, intermedial bones are very rare, even in extensive water in the head.—*Loder*, Anat. Handb. Part I. p. 46, in note, mentions two instances of intermedial bones in monkeys. —*Wiedemann* Archiv, u. s. w. Vol. III. Part II. in an ant-eater.—*Greve* Bruchstücke vergl. Anat. und Physiol. p. 10, Oldenb. 1818, in hares, rabbits, and dogs;—in lambs, my Selt. Beob. Vol. I. p. 39.—*G. Jäger* in *Meckel's* Archiv f. Anat. und Phys. 1826, p. 72.

(5) *Lachmund* in Misc. Nat. Cur. 1675 and 1676, p. 241.—*Stähelin* Obs. botan. anat. in *Haller's* Coll. disp. anat. Vol. VI. p. 671, with figs.—*van Doeveren* Spec. observat. acad. p. 189, pl. 7, fig. 1—3, two cases.—*Sandifort* Observ. anat. pathol. Vol. III. tab. 9, fig. 3—7.—*Hebenstreit* De rarior. quibusdam ossium momentis, p. 5. Lips. 1740. My Verzeichniss der anat. Präparatensammlung, No. 184—186, 8034. There is also (No. 4566,) in the skull of an ateles paniscus a fontanel bone, of which I have also seen a beautiful instance in the Anat. Mus. of the Joseph Academy at Vienna, a similar instance in the Anat. Mus. at Zurich, and at Strasburg, and two examples in the Anat. Mus. at Heidelberg.

(6) A very remarkable instance is mentioned by *Prochaska* Disq. anat. phys. organismi c. h. 4to. Viennæ, 1822, tab. 8—10. p. 177.

(7) *Curtius* De monstro humano. L. B. 1762.—*Gilibert* Advers. med. pract. Lucubratio anat. de fœtu acephalo, p. 122. My Verzeichniss, &c. No. 3044.

(8) *Hippocrates* early considered microcephalia as the cause of idiotcy.—*J. E. Greding* Sämmtliche medicinische Schriften, herausgegeben von *C. W. Greding*. Greiz, 1790.—*Georget* de la Folie. Paris, 1820, p. 478.—*Spurzheim*, Observations on the deranged manifestations of the mind, or insanity. 8vo. London, 1817.—*Esquirol* in Dict. des Sc. médicales. Vol. XXIII. p. 521, and in Pathologie und Therapie der Seelenstörungen, deutsch von *Hille*, p. 515. 8vo. Leipz. 1827.—A very remarkable instance is given by *Blumenbach* De anomalis et vitiosis quibusdam nisus formativi aberrationibus Comment. 4to. Gött. 1813. tab. 2, p. 17.—Smallness, depression, and obliquity of the forehead in an idiotic child of two years old.—My Verzeichniss, &c. No. 3016.

(9) My Selt. Beob. Part I. p. 72.

(10) Good engravings are given by *Gall* Anat. et Physiol. du Système nerveux en général, etc. Pl. 21—24.—*Sandifort* Mus. anat. Vol. II. tab. 6—12.—*Rudolphi* in Abhandl. der Akademie der Wiss. zu Berlin, 1827, pl. 3—5. —*Baillie*, Engravings of morbid Anat. Fasc. X. pl. 3, fig. 1.—*Monro's* Outlines of the Anatomy, &c. pl. 21.—*Klein* Kurze Beschreibung einiger seltenen Wasserköpfe. 4to. Stuttg. 1819, tab. 1 and 2.—Great increase of the size of the skull is described in the Gazette de Santé, 1817. v. *Rust's* Magazin f. d. ges. Heilk. Vol. IV. Part I. p. 187, (2 feet 3 inches in circumference; I saw this person in the Charité at Lyons.)—*Valentin* in Journ. de Médec. Chir. et Pharm. Paris, Octob. 1816, (circumference 26½ inches.)—*Ehrlich* Chir. auf Reisen gemachte Beobacht. Leipz. 1795. Vol. I. (in *Cruikshank's* collection 2 feet 5 inches in circumference.)—In New England Journ. of Med. and Surgery, Vol. IV. No. 1. Jan. 1815, p. 21, (circumference 2½ feet.)—*Lobstein* Compte rendu, etc. 1824, p. 62, No. 36, (circumference 2 feet 3 inches.)—*J. P. Horn* Bemerk. und Erfahr. über einige Gegenstände der prakt. Geburtshülfe. 8vo. Wien, 1826, tab. 1, (circumference in a new-born child 21 inches.)—*Himly* in Gött. gel. Anzeigen, 1827, No. 69, p. 681, (33¼ inches, Calenberg measure, in circumference.)—My Verzeichniss, No. 3089 and 3090.—*Kohler* Beschreibung der physiol. u. pathol. Präparate. — *Loder*, p. 103, No. 365, described by *Kaltschmied* Pr. de hydrocephalo interno raræ magnitudinis in *Mettelhaüser* D. de via chyle ab intestinis ad sanguinem. Jenæ, 1752, with plates, (33 inches in circumference.) — A drawing of *Himly's* case is given by *E. A. W. Himly*

Darstellung des Dualismus am normalen und abnormen menschl. Körper. Hanover, 1829, p. 21, pl. 5 and 6.—Among animals the skull is frequently very much expanded by dropsy, in the horse, ox, (of which there are two very large, No. 8059 and 8060, besides three less large in the Bresl. Mus.) and sheep, rarely in other mammalia, and never in birds.—[There is in the Mus. at Guy's Hospital, the skull of a hydrocephalic man, who lived to the age of twenty-nine years, whose skull measured 33½ inches in circumference.—Also at St. Thomas's Mus., the skull of a child of about two years, which measured 29 inches. T.]

(11) Compare my Verzeichniss, &c. No. 163, 164, 210, 3057—3063, 3068, and 8046.—*Hesselbach* Beschreibung der pathol. Präparate zu Würzburg. p. 3. —On obliquity of the skull compare *Loschge* de scelete hom. symmetrico, p. 41. —*Mechel* anat. phys. Beobacht. und Untersuch. p. 247. 8vo. Halæ, 1822—*Sandifort*, Vol. II. pl. 8 and 9.—*Köhler* Beschreib. der anat. und physiol. Präparate, etc. p. 134.—The obliquity of the skull, in many cetaceous animals, is natural to them. A peculiar deformity of the skull, viz. a very large bony cyst with a large cavity on the temple, occurs in fowls, geese, ducks, pigeons, and canary birds; v. *Borellus* Hist. et observat. rarior. ed. 1656, p. 154.—*Stobaeus* in Act. literar. Speciæ 7730, Vol. III. p. 53.—*Pallas* Spicil. IV. p. 22.—*Sandifort* Mus. anat. Vol. I. p. 806. — *Blumenbach*, p. 19, tab. 1. fig. 2 and 3.—[*Dupre*, Phil. Trans. 1699, p. 372. — In the skull of a female child, a native of Van Dieman's Land, No. 99, Mus. Roy. Coll. Surg., there is great projection in the central part of the parietal bone, giving an angular form to the head. T.]

(12) In the Anat. Mus. at Bonn, I saw a skull, on account of the imperfect formation of which, the left half of the cerebellum was very flat in that region.—*M. J. Weber*, Specimen malæ conformationis encephali capitis et pelvis viri. 4to. Bonnæ, 1828, with lithog. tab.

(13) I have seen this not unfrequently. Compare Verzeichniss der Breslauer anat. Präparatensammlung, No. 163—165. I have also seen it in some cretin skulls.

(14) My Selt. Beob. Part I. p. 74, No. 32. An instance from face-ache in *Blumenbach's* Geschichte u. Beschreibung der Knochen. 2d edit. p. 29, note f.—*Gall* Anat. et Physiol. du Système nerveux, etc. with figures, pl. 53, a skull, the left half of which had become atrophic from abscesses in the optic beds.

(15) Frequently is the skull not merely too small, but also otherwise abnormally formed, thus the forehead too small and too inclined, &c. v. *Gall*, pl. 18—2029.—*Reil* in his and *Hoffbauer's* Beitr zur Beforderung der psychischen Curmethode, Vol. II. Part I.—*Esquirol* in Dict. des Sc. médic. Art. Démonomanie, Vol. VIII. p. 294, tab. 1—4. and Pathol. und Therapie der Seelenstörungen, p. 315.—*Georget* De la Folie. p. 478. Paris, 1820.—*Wittwerck* D. de varia hum. cranii forma. 4to. Berol, 1825, with two engravings. But especially *Blumenbach* De anomalis et vitiosis quibusdam nisus formativi aberrationibus Comment. p. 17, pl. 2.

(16) For instance, unsymmetrical, compressed laterally, with a high vertex; internally with strong development, &c.—*Pinel* Récherches anatomiques sur les vices de conformation du crane des aliénés in Bull. de la Soc. philomath. Ann. IV. Vol. II. p. 103, 109. — *Georget*, p. 480. — My Selt. Beob. p. 72, No. 31.—*Romberg* Untersuchung irrer Personen, in the Zeitschrift für psychische Aertze, 1822. Part I. p. 124, and in the Zeitschrift für die Anthropologie von *Nasse*, 1828, Part III. p. 195.—*Esquirol* Pathologie und Therapie der Seelenstörungen, u.s.w. p. 483.

(17) Generally very broad, often as broad as long, shallow from above to below, the base of the skull often uplifted in the middle, &c. Compare *Ackermann* Ueber die Cretinen, &c. 8vo. Gotha, 1790.—*Foderé* Essai sur le goitre et le crétinisme. 8vo. Turin, 1792, 2d edit. Paris, Ann. VIII.—*Michaelis* in *Blumenbach's* medic. Biblioth. Ricordi della anatomia chirurgica, etc. Padova, 1801.—*Wenzel* Ueber den Cretinismus. Wien, 1802. — *Iphoff* D. de Cretinismo. Viteberg. 1804.—*Reeve* in Philos. Transact. 1808. Part I. No. 7, p. 111, pl. 2 and 3. — *Prochaska* Disquis. anat. phys. organismi, etc. p. 177, tab. 8—10. Viennæ, 1812, and in Physiologie. 2d edit. 1820. Abschnitt VI.—*Andreæ* D. quædam de Cretinismo. 4to. Berol. 1814, with engravings.—*Osiander* in

Gött. gel. Anzeig. 1817, Part CXXXII.—*Iphofen* der Cretinismus, philosophisch und medicinisch üntersucht. 2 Theile. 8vo. Dresd. 1817, tab. 5.—*Sensburg* Der Cretinismus, mit besonderer Rücksicht auf dessen Erscheinung in Untermain- und Rezatkreise. Würzb. 1825. — *T. H. Wilke* D. de Cretinismo. 4to. Berol. 1828, with two engravings.

(18) For instance, of a very elongated form in a Scythian people on the Mæotic lake. v. *Hippocrates* Op. omnia, ed. *Kühn*, Vol. I. Lips. 1825. L. de aëre, locis et aquis, p. 551.—Pressing back of the forehead in the Caribbees and Americans from Colombia river, v. *Blumenbach* decas cranior. divers. gent. Dec. I. tab. 10, and Dec. II. tab. 20. — *Lawrence*, Lectures on Physiology, Zoology, and the natural History of Man. London, 1822, pl. 11. — *Mitchill* in New-York Repository, April, 1821.—Pressure from above, as in the Chocktaws and old Peruvians. v. *Blumenbach*, Dec. I, tab. 9.—[A deep broad transverse groove from pressure, passing over the vertex, as in the skulls of the people of Nootka Sound, in the Anat. Mus. at Christchurch, Oxford.—Three Peruvian skulls in the Mus. Roy. Coll. Surg. No. 63, 64, 65; but especially the former, resemble the skulls of the Caribs, in the great depression of the forehead, but in these it is considered a natural formation. T.]

(19) The ancients distinguish ἕδρα, sedes seu vestigium,—ἐκκοπὴ, excisio,—διακοπὴ, præcisio,—ἀποσκεπαρνισμὸς, dedolatio, θλᾶσις and ἔνθλασις, etc.; sometimes it is congenital; when subsequent, is always connected with fracture; sometimes only the outer table and diploe are depressed; in other cases, the whole bone deeply so, without great injury. v. *de Plouquet* Repertor. Art. Cranii Depressio.—*Crull* D. de depressione cranii. Jenæ, 1808. — *Stalp. van der Wiel* Observat. rarior. p. 27. Leidæ, 1727. — *Isenflamm's* Anat. Untersuchungen, p. 123.— *Klein* in *Graefe's* Journ. f. die Chir. Vol. III. p. 226. — My Seltene Beobachtungen. I. p. 75, No. 33. — *Home* in Philos. Transact. 1814, Part II. p. 469.—Congenital indentation observed by *Sandifort*, Vol. II. tab. 34.—*Frank* in *Textor's* Neuem Chiron. Vol. I. Part II. p. 261.—[A few years since, a child, about three years old, was admitted into St. Thomas's Hospital, with a depression on the upper and back part of the parietal bone, caused by a fall, which was nearly large enough to hold a dessert spoon. No symptoms occurred, and as there was no external wound, it could not be perfectly decided, but it was believed to be a mere indentation without fracture. T]

(20) My Verzeichniss der Breslauer Präparatensammlung, No. 3065, 3076, and 3169.

(21) To wit, from external encysted tumours, from internally enlarged pacchionic glands, very expanded blood-vessels, watery bags, as in the gid of sheep, &c.

(22) I have indeed seen this in twenty monsters, of men, horses, oxen, and sheep, mostly accompanied with traces of dropsy of the head and general dropsy, although sometimes also without.—For instance, in two children, v. Verzeichniss, &c. No. 3079, 3080; and in a third, which was born without eyes, and with monstrosity of the extremities; in an almost full-grown man, No. 3081; in a child with sarcom on the head, v. Seltene Beobachtungen, II. p. 1661. As such openings, however, sometimes become ossified at a later period, so also on the contrary, may membranous parts of the skull be produced at a late period, especially in dropsy of the head, in the gid in sheep, from absorption, &c. A woman who had exostosis in the pelvis, was delivered of four children, in which there was an unossified indentation on the forehead. v. *Frank*.—In *Osiander's* collection at Göttingen, I saw the skull of a bitch membranous in several spots, and she had produced similar puppies. Instances of such membranous patches on the skull are given by *Veirac* and *Portal* sur Rhachitisme; *Bidloo* Opera omnia. p. 191, tab. 3. L. B. 1715. — *Sandifort* Obs. anat. pathol. L. III. cap. 10, p. 132 and 137, and Mus. anat. Vol. II. p. 16, tab. 34. — *Stark* Neues Archiv f. die Geburtshülfe, Vol. I. p. 422. — *Löffler*, *ib.* p. 428, note. — *Osiander* Beobacht. und Abhandl. u. s. w. p. 223. 1787. — *Baillie*, Engravings, Fasc. VIII. pl. 3, fig. 2. — *Howship*, Practical Observations in Surgery, p. 33, from a fall. — *Palletta* Exercit. patholog. I. p. 127. — *Hesselbach* Beschreibung der patholog. Präparaten zu Würzburgh. p. 8. No. 652.

Gall, pl. 49. — *Cerutti* Beschreibung der pathol. Präparate des anat. Mus. zu Leipzig, No. 761. In a Cretin, v. *Prochaska*, &c.—Sometimes the fontanels remain open for a long time, even throughout life. v. *Casp. Bauhini* Theatr. p. 280.—*Lachmund* in Miscell. Acad. Nat. Cur. 1675—1676, p. 240, in a man twenty-three years old.—*Nil Rosen* resp. *Sidren* de Ossibus calvariæ. Upsal, 1746.—*Mayer* Beschreibung des ganzen mencshl. Körpers. Vol. II. p. 63; in a woman of some twenty years old I have also seen this, as also an open fontanel in a monstrous sheep. v. Selt. Beob. I. No. 9, p. 30, the great fontanel remains long open as a peculiarity in some kinds of sheep, which are called heath sheep. We also sometimes see it in pug dogs. v. *Greve* Bruchstücke zur vergl. Anatomie und Physiologie, p. 1. Oldenburgh, 1828, in the various kinds of birds with large cells; the bony cell is frequently ossified imperfectly.

(23) *Morgagni* De sedib. et caus. morbor. Ep. III. p. 2, IV. p. 15, XIV. p. 35, XXVII. p. 2, LX. p. 12. — *Albinus* Index suppellect. anat. Raviani. No. 27, 29, p. 4. — *Sandifort* Mus. anat. Vol. II. tab. 13.—*Voigtel* Pathol. anat. Vol. I. p. 272.—*Monro*, Outlines of Anatomy, pl. 12.—*Biermayer* Museum anat. pathol. No. 221, 317, 563.—*Hollberg* in Ars-Berättelse om Svenska Sällskapets Arbeten, of *Carlander*, Stockh. 1818, in a child twenty months old. — *Wendt* in *v. Froriep's* Notizen, No. 65, p. 327, on the back of the head, probably from muscular exertion. — My Verzeichniss, &c. No. 3093—3097, 3115. — In animals, a morbid thickening of the skull is very rare, excepting such as are scrofulous, in which I have seen it several times.

(24) Thickening of the skull occurs in insane persons, and it is so much greater as it is farther back.—*Greding* found the skull too thick in 151 out of 196 individuals.—*Georget*, p. 480, found it 1-20th too thick in 480 out of 500 such skulls. v. also *Esquirol.*—*Gall* thought the skull was too thick and ivory like in all suicides, which however is by no means generally the case.

(25) Compare above § 119, note 4.

(26) I saw a skull of this kind in the Surgical Academy at Copenhagen, and there is a similar one in Bresl. Mus.

(27) *Caspart* D. de exostosi cranii rariore. Argentor. 1730; and in *Haller's* Coll. Diss. chir. I. No. 4. — *Mögling* in Eph. Acad. N. C. Cent. V. and VI. p. 221.—*Müller* D. de febre biliosa, subjuncta observatione exostoseos in cranio repertæ. Argentor. 1782.—*Tarin* in Act. Nat. Cur. Vol. VIII. p. 251.—*Baillie*, Engravings, Fasc. X. pl. 1, fig. 2.—*Köhler*, p. 29, No. 100, a very large internal one.—*Römhild* D. continens nonnulla de exostosibus in olla capitis. 8vo. Goett. 1808, with engravings, from *Blumenbach's* Collection, engraved and described in *J. P. Frank's* Opuscula posthuma. p. 102, tab. 4—6. 8vo. Viennæ, 1824. — *Prochaska* Disquisitio anat. physiol. organismi, etc. tab. 6 and 7. 1822.—I saw a remarkable case in the Cabinet d'ecole de Médecine at Paris, it is engraved in the Dict. des Sc. medic. Vol. XXXV. p. 26, pl. 3. — *Hartmann* in *Rust's* Magazin f. die ges. Heilk. Vol. III. Part I. p. 19. — *Hesselbach*, No. 371.—*Wittwerck.* — My Verzeichniss, &c. No. 3100—3147. — Injuries of the skull are sometimes cured by exostosis, to wit, *Sandifort* Mus. anat. Vol. II. tab. 19.—Myself, No. 3106, 3108.

(28) Especially in the cavity of the skull of oxen. v. *Vallisneri* De Animalium cerebris ut vulgo creditum est, lapidescentibus in Op. I. p. 80.—*Soemmerring* Anhang zu *Baillie*, p. 180, engraved in *Rheineck* Medic. u. chir. Beobacht. über die einfache Methode, des Serten-Blasensteinschnittes, pl. 3, fig. 21. 8vo. Berl. 1815. — *G. Moreschi*, v. *Zschokke's* Miscellen f. die Neueste Weltkunde, No. 92. 1809.—Ephem. N. C. Dec. I. Ann. I. Obs. 26, p. 92. — *Th. Bartholini*, Epist. VIII. Cent. III. and VI.; and Histor. med. Obs. XCI. p. 357.—*Giro* in Annuare de la Soc. de Médic. du Depart. de l'Eure, 1810, p. 90.—*Dobrzensky de Negroponte* in Miss. Acad. N. C. Dec. I. Ann. I. 1670, p. 289. Ann. II. App. p. 8. — *Duverney* in Mém. de Paris, 1703. Hist. p. 26. Mém. p. 261.—*Baron* in Mémoir. de Paris, 1753. Hist. p. 134. — *Pitschel* Anat. chir. Anmerkungen, Dresden, 1784, now in the Anat. Mus. of the Academy of Surgery at Dresden. My Selt. Beob. I. p. 79, tab. 1, fig. 3.—*Simson*, An Inquiry how far the vital and animal actions, &c. p. 259. 8vo. Edinb. 1752, with engravings.—*Sandifort* Mus. anatom. Vol. III. No. 650, p. 392.—I saw a similar exostosis in

the Imperial Museum of Florence; and another in the collection of *Sömmerring*.—I saw a large exostosis on the skull of a roe, in the collection of *Schinz*, at Zurich; on the skull of a fowl, v. Nat. Cur. Observ. med. phys. Cent. III. and IV. Obs. 96, p. 257; on the skull of an epileptic canary-bird.—*Goldfuss.*

(29) *Boerhavii* Præl. de morbor. nervor I. p. 141.—*Fordyce* De Hemicrania § 33.—*Platner* De vi corporis in memor. I. p. 31.—*Greding*, p. 32.—The London medic. Repository by *Burrows* and *Thomson*, Jan. 1817.—My Selt. Beob. I. p. 72. No. 31, Verzeichniss, &c. No. 233, 234, 236, 238, 240, 242, 243, 3064, 3067, 3109, and 3110.

(30) Of which, in the several bones.

(31) Several examples in *Sandifort*. *Voigtel*, Pathol. Anat. Vol. I. p. 286.—My Verzeichniss, &c. No. 187—190.

(32) Many instances in *de Plouquet* Repertor. Art. Cranii suturæ, Cephalæa, Hydrops capitis, Sutura, &c. Such a case of diastasis from dropsy of the head, in a boy of seven years, is found in the works of *M. Baillie* ed. *Wardrop*. Lond. 1825. Vol. I. first described in Medical Transact. Vol. IV. 1813.—My Selt. Beob. II. p. 95, No. 42; Verzeichniss der anat. Präparatensammlung, No. 3120.

(33) A too perfect state of the sutures and the fontanels, for the most part, or completely closed, is not very unfrequent in newly born children; v. *Osiander* Annalen der Entbindungslehranstalt zu Gött. 1800, p. 27.—*Busch* in *Stark's* N. Archiv für Geburtshülfe. II. p. 96.—*Jörg* Handb. der Kinderkrankheiten. Leipz. 1826, p. 315, § 316. I have seen several such instances, also complete ossification of single sutures in human and brute monsters, to wit, No. 3012, 3047, 3052, 8056, 8226, 8227.

(34) *Lentin* in *Blumenbach's* Medic. Biblioth. Vol. III. p. 525, (all the sutures in a boy six years old.)—*Desessarz* in Mém. de l'Instit. nation. des Sc. Vol. I. p. 234, (all the sutures in a boy twelve years old,) individual sutures are pretty frequently seen closed.

(35) v. my Verzeichniss der anat. Präparatensammlung, p. 4—6, in which such varieties exist, for instance, No. 179—182, 209, 214, 226—229.

(36) To wit, a kind of middle fontanel in the sagittal suture. v. *Stein's* geburtshülf. Wahrnehmungen I. p. 345.—*Meckel* Anat. physiol. Beobacht. und Untersuchungen, p. 3 and 50. Halæ, 1822. I have also found it twice.

(37) In *Loder's* Cabinet, v. *Köhler*, p. 50, No. 171.

(38) A good engraving of a large half-united incised wound, in *Sandifort* Mus. anat. Vol. II. pl. 19.—A remarkable injury of the skull, which a suicide effected on his forehead with an axe, I have described in my Selt. Beob. II. p. 14. v. Verzeichniss des Museums, No. 3183, in which occur, from No. 3169 to 3195, many instances of injuries of the skull; of the congenital, v. below, in the fœtus. Pieces of the skull which have been cut off obliquely are sometimes healed with some loss of substance; for instance, *Sandifort*, Vol. II. tab. 20. fig. 1; a case in Bresl. Mus. No. 8250, and some cases in the Anat. Mus. of the Joseph Acad. at Vienna. [There is in the Museum at St. Thomas's Hospital, a fine instance of union of a portion of the parietal bone about the size of a half-crown, which had been struck off by a sabre. T.]

(39) Fissures of the skull sometimes do not heal for a very long time; such cases are described by *Duverney* in Mém. de l'Académie de Chirurgie. Vol. I.—*Stanley* in Medic. chir. Transact. Vol. VIII. p. 24, pl. 1.—*Eltze* D. de fracturis baseos cranii cognoscendis quædam. 8vo. Berol. 1826.—Good engravings of fissures are given by *Sandifort*, Mus. anat. II. pl. 17 and 18.

(40) v. my Verzeichniss, &c. No. 3122, 3124, 3128—3131, 3164.—*Sandifort* gives good engravings of such holes in his Mus. anat. II. pl. 20—24, 26, 27.

(41) *James Russel*, Some observations of a peculiar affection, to which the bones of the cranium are liable, in Transact. of the medico-chir. Soc. of Edinb. 1824, No. 3.—*Cullerier* Observations des nécroses du crane produites par la syphilis in Annuaire méd. chir. sur des Hôpitaux et Hospices civiles de Paris, 1819, p. 437. [A Fasciculus containing nine lithographic anatomical drawings, &c. pl. 7. fig. 1. T.]

(42) *Palletta* De tuberculis ossivoris in Exercit. pathol. I. p. 93—104.

(43) *Le Clerc* Maladies des Os, etc. v. *Haller's* Biblioth. chir. I. p. 469.—

Pelletan Clinique chirurgicale, Vol. II. fig. 1.—*Richter* in *v. Froriep's* Notizen, Feb. 1822, No. 24, p. 29.—*Krimer* in *v. Gräfe's* and *v. Walther's* Journ. f. d. Chir. 1827. Vol. X. Part IV. p. 587.—In a case related by *Flint* in New-England Journ. of Medic. and Surgery, new series, Vol. IV. April, 1820, a bloody tumour sprung through an opening on the occiput connected with the sinus transversus. I have also before me a similar case in a boy of five years old.

(44) *Crell* resp. *Kaufmann* D. de Tumore capitis fungoso post cariem cranii exorto. Helmst. 1743, cum icone, in *Haller's* Coll. Diss. chir. I. No. 3.—*Sandifort* Exercit. academ. Lib. II. p. 40, tab. 3.—Museum anat. Vol. I. p. 152. Vol. II. p. 142, tab. 13, fig. 6—9.—*v. Siebold* in *Arnemann's* Magazin für die Wundarzneiwiss. Gott. 1797, Vol. I. Part IV. p. 389, with engravings.—*Cheston Browne* in Philos. Transact. 1780, Vol. LXX. p. 323, with engravings.—*Baillie* Engravings, Fasc. X. pl. 5. fig. 1.—*Home*, Transact. for the improvement of Med. and Surg. Knowledge. Lond. 1812, Vol. III. tab. 2.—*v. Walther* in his and *v. Gräfe's* Journ. f. Chir. Vol. I. Part I. p. 55.—*Ficker, ib.* Vol. II. Part II. p. 219.—*Calliot* Diss. sur l'encephaloides ou fongus medullaire. Strasb. p. 25, Obs. vi.—*Wishart* in Edinb. Med. and Surgical Journ. July, 1822, p. 393. *Schneider* Diss. de fungo hæmatode. 4to Berol. 1821, with engravings.—*Eck* in *v. Gräfe's* and *v. Walther's* Journ. f. Chir. Vol. V. Part I. p. 105.—My Selt. Beob. II. p. 82; No. 2133, of Bresl. Mus. — *Seerig* Comm. nonnulla de fungi duræ matris origine et diagnosi, tab. 1. Vratisl. 1825.—*Hesselbach* Beschreib. der pathol. Präparate zu Würzburg, p. 63, No. 642.—*Schwarzschild* D. de fungis, capitis et duræ matris. 4to. Heidelb. 1825, with four lithographs.—*Salomon* in Petersb. vermischt. Abhandl. III. 1825, p. 237.—*Schindler* in *Rust's* Magazin f. d. ges. Heilk. 1827, Vol. XXV. Part II. p. 267.—*G. Sandifort* Mus. Anat. Vol. III. p. 158, No. 127.—*C. Graff* in *v. Gräfe* and *v. Walther's* Journal der chir. Vol. X. Part I. No. 4.—*Weffer.*—*Abercrombie* Pathological and practical researches on diseases of the brain and spinal cord. 8vo. Edinb. 1828.—*A. G. Rhodius* D. casum singularem de amaurosi cranii osteosarcomate effecta. 4to Berol. 1829, with engravings, (on the right side of the sphenoid bone;) *Ebermaier* Ueber den Schwamm der schedel knocken und die schwammartigen Auswüchse der harten Hirnhaut. 4to. Dusseld. 1829, with 10 lithographic plates.

(45) *Landmann* Comm. pathol. anat. exh. morbum cerebri oculique singularem, 4to. Lips. 1820, with three engravings.—Myself, p. 86, No. 2356, of the Bresl. Mus.

§ 123.

Sometimes the FRONTAL BONE is entirely deficient, and its place supplied by the elongated parietal bones,[1] the frontal portion of this bone is very commonly deficient in anencephalous monsters, and its orbitar portion, as in dropsy of the head, is short and depressed backwards. In hydrencephalous children and insane persons, the frontal portion is oftentimes very much inclined backwards, whilst in dropsy of the head and rickets it is usually very prominent and much expanded. The frontal suture remains, in men, especially with broad foreheads, partially or entirely, often for a long time, or even permanently, unconsolidated,[1*] whilst on the contrary in those animals, in which it regularly remains open, its consolidation is sometimes observed.[2] In rare cases the frontal suture does not proceed straight to the sagittal.[3] The *crista frontalis* has been seen remarkably prominent,[4] and the

nasal spine abnormally enlarged.[5] The FRONTAL SINUSES frequently present variations;[6] in rare cases indeed both are wanting,[7] or there is but one, or they are unusually small; they become contracted by disease, or are completely filled by bony substance.[8] On the contrary, we sometimes find them unusually large, both as congenital formations,[9] and as consequent on morbid extension.[10] They are often much destroyed by caries, particularly in syphilis, and glanders in horses, &c. Not unfrequently there arise from the frontal bone, HORNS and ANTLERS, which are irregular. Sometimes these are entirely deficient, and such deficiency becomes hereditary and characteristic of a peculiar race;[11] more rarely but one horn or antler is deficient;[12] or in cattle, there is only the tip of the corniferous process, so that the distorted horn is merely attached to the skin. On the contrary, we observe also too many horns, for instance, in sheep,[13] goats,[14] in the antilope saiga,[15] the deer-kind,[16] and oxen;[17] also the females of the deer and roe kind which are naturally hornless, possess antlers, especially in old age; these, however, always remain smaller than the normal horns of the male.[18] Frequently do the form of the horns and antlers[19] vary, inasmuch as they are observed in sickly deer and roes too small,[20] become curved in animals which are otherwise healthy, or are merely malformed in various ways.[20*] Vices of texture, similar to those of other bones, also attack the bony core of horns and antlers; we observe them deficient of lime, and therefore spongy, light, and frangible;[21] too full of lime, and therefore too solid and heavy, and studded on their surface with increasing exostoses.[22] The bony core inflames, is more or less destroyed by caries,[23] and even separated from the horny covering. In rarer instances we observe in deer and roes, instead of the deficient antler, or upon it, a large or small quantity of soft movable swellings, often attached to a neck, which for the most part consist externally of fine hairs, but within of a cartilaginous substance. In sporting language, such roe is called a ROE-KING.[24] When great violence is applied to the horns, they break, sometimes only one of them, or they even actually break off, which in oxen usually occurs close to the head.

(1) *Bonnet*, Medic. septentr. collat. Vol. I. p. 19.

(1*) [It was remarked by Dr. Leach and others, who have seen the collection of crania in the catacombs at Paris, that the frontal suture remained unobliterated in at least one of eleven skulls.—*Clift* in catal. of Mus. Roy. Coll. Surg. Part III. p. 7. T.]

(2) For instance, in sheep; v. my Selt. Beob. I. No. 10, p. 31. No. 11, p. 34, and No. 12, p. 39. Congenital consolidation of the frontal suture has also been noticed in the human subject; v. my Selt. Beob. I. p. 5;—*Sandifort* Mus. Anat. Vol. III. p. 99. No. 687.

(3) My Verzeichniss, No. 179.

(4) In one instance as a long sickle-shaped bony plate, about a third of an inch broad. *Blumenbach* Geschichte und Beschriebung der knocken. 2d edit. p. 114, note 1.

(5) *Siebergundi* in *Harless* Rhein. Westphäl. Jahrb. Vol. II. Part II. No. 2.

(6) *Runge* præs. *Ziegler* D. de morbis præcipuis sinuum ossis frontis, etc. 4to. Rintel. 1750.—*Welge* D. de morbis sinuum frontalium, etc. 4to. Gött. 1786.

(7) *Morgagni* De sed. et caus. morb. Lib. V. Epis. LXIII. Art. 13. *Blumenbach*, p. 111, note 1, says that their development is prevented by water in the head, and rickets, which I have also seen several times. *Prochaska*, Disquis. anat. phys. organismi corp. hum. tab. 8, also mentions the same from cretinism.

(8) *Horn* in his Archiv für die medic. Erfahrung. 1815. Part III. p. 552.

(9) My Verzeichniss, &c. No. 170 and 3226.

(10) Not merely is its anterior wall then protruded, like a bladder, but sometimes the internal also very remarkably, so that the brain is compressed; for instance, *Horn*, 1815, Part V. p. 854. I once saw the right frontal sinus in a young roe much expanded by a scrofulous swelling. Selt. Beob. Part I. p. 78. No. 35, Museum, No. 2361.

(11) It is well known that there are unhorned varieties of oxen, sheep, and goats. A bull, which was accidentally without horns, implanted this vice upon all its male progeny, and thus gave rise to the now common race of oxen in Paraguay. v. *Azara's* Reise nach Südamerika, p. 161. Berl. 1810.—A cow, which had lost the left horn by suppuration, subsequently produced three calves, which had merely a claw-like horny scale on that side instead of a horn. See *Thaer* in the Moegliner Annalen, 1822, Vol. X. p. 154. — In the forests of Erbach were observed, for several years, stags which in the first year had no antlers, and subsequently merely prickers; see *Wildungen* Taschenbuch, 1802, p. 73. In rare cases also the horns are wanting in buffaloes; v. *Cuvier* Ossemens fossiles, Vol. IV. p. 123. Plate 10. fig. 7—9.

(12) *Anaxagoras* dissected, in the time of Pericles, the head of a ram with but a single horn, *Plutarch;* in the antilope saiga sometimes there is only a single horn. *Linné* System. anat. ed. *Gmelin*, Vol. I. p. 185.—At Mr. *Klinkenberg's*, apothecary at Utretcht, I saw the skull of a roe with but one antler, and that on the right side. If a stag or roebuck be castrated only on one side, on that side no antler is reproduced.

(13) Such a ram is sketched in the Ecarts de la Nature, tab. 18. *Sturm* in Viehrassen, Jena, 1819, Part II. pl. 6.—A similar one exists in Bresl. Mus. No. 3223. In Iceland sheep we find as many as eight horns, also in other sheep five horns; for instance, *Radzcynski* Historia Poloniæ animalium, Vol. II. p. 464, upon Ovis polycerata. v. *Linné* Ammoen. acad. Vol. IV. p. 174.

(14) Skulls of goats with four horns are not very uncommon; there are three of them in Bresl. Mus. No. 3222, 4672, 8217.

(15) *Linné.*

(16) Double antlers and supernumerary shoots are not uncommon in stags and roes. Nov. Acta N. Cur. Vol. I. Obs. 39. p. 148.—*Aelian* Animal, Lib. XI. cap. 36. In Bresl. Mus. there are the double antlers of two roes, No. 3211, 3212. I saw, in the Ashmolean Museum, at Oxford, the skull of a roe with a third horn in the middle and in front of the other two; and in the Museum of Natural History at Copenhagen a skull of an elk, in which the left antler is double. [No. 272, Mus. Roy. Coll. Surg. a double horn in a goat. T.]

(17) An instance of three horns is given by *Radzcynski;* a similar one may be seen at Madrid. [No. 271, Mus. Roy. Coll. Surg. is a remarkable instance of a third horn in a cow, growing from the centre of the forehead, between the eyes; it arises by a broad base, the greatest diameter of which is $9\frac{1}{4}$ inches; it forms an elevated crest, extending forwards as far as the extremity of the nose, is hollow or concave on its inferior surface, and composed of a loose fibrous structure. T.]

(18) Of hinds with horns there are many examples in Anglica Normannica a veteribus scripta ex bibliotheca *G. Camdeni*, Itinerarium, Cambriæ. Francof. 1603, p. 821. — Ephem. N. Cur. Ann. IX and X. Obs. 88, p. 225, and Dec. II.

Ann. II. Obs. 98, p. 247.—*G. E. Stahl* De cornu cervi deciduo. Halæ, 1699.—*Scheuchzer* in *Leopoldi* D. de alce. Basil. 1700.—*Valmont de Bomaine* in Journ. de Physique, Vol. VI. p. 501.—*Ridinger* Abbild. seltener Thiere Tab. 79.—*Jam. Hoy* in Transact. of the Linnean Society, Vol. II. p. 356—*v. Wildungen* Taschenbuch für Forst-und Jagdfreunde. 1800, p. 14.—*Gr. Mellin, ib.* 1805, p. 13.—In roes this is noticed in Eph. N. Cur. Dec. II. Ann. VI. Obs. 192, p. 367.—*v. Wildungen,* 1801, p. 178.—I saw an antler of this kind in the Zootomical Cabinet at Paris, and three examples are to be found in Bresl. Mus. No. 3217—3219; in a fourth instance, No. 4668, the animal was even with young. Compare Selt. Beob. Part I. No. 30, p. 71. [No. 16, Mus. Roy. Coll. Surg. is an instance of an old roe hind, which had horns, the longer of which did not exceed three inches. And in the note accompanying this, Lord Egremont states that it is not uncommon to see imperfectly formed horns in the roebuck, stag, and fallow deer which are old and past their prime. T.]

(19) There is a rich collection of malformed antlers in the hunting castle of Moritzburg, at Dresden. Compare Allgem. Historie der Natur. Vol. II. Part III. p. 88, 109, 134. Vol. I. Part VIII. p. 127.—Of a reindeer, Vol. II. Part VI. p. 80.—*Ridinger,* pl. 81, and in Blätter rarer monströser Hirsche. fol. Augsb. 1740.—*v. Wildungen* Jagdkalender 1799, pl. 3, and Taschenbuch für Forst-und Jagdfreunde, 1809—1812.—My Verzeichniss, No. 3202—3221.

(20) Such distorted roe horns have given rise to the fable of hares with horns.

(20*) [Horns sometimes grow parallel to each other, become firmly united throughout their whole length, producing the appearance of a single horn; a good example of which is seen in the Ovis Ammon, No. 1043. in Mus. Roy. Coll. Surg. T]

(21) I kept a stag for twelve years, which at two years old I had castrated, it put up yearly, when it shed its coat, new long prickers, which were mostly covered with velvet, and were so brittle that the stag never attempted to but with them, but if angered, used his fore feet as weapons. [This is a remarkable exception to the fact usually noted, that animals which have deciduous horns, never shed them after castration; there are several instances of such permanent horns in stags, in the Mus. Roy. Coll. Surg. And further to shew the intimate connexion between the growth of horns and the generative functions, it has been observed that if a stag have its horn broken during its growth, the animal is for that year impotent. T.]

(22) Allgem. Historie der Natur. Vol. II. Part III. p. 87, No. 587.—My Verzeichniss, No. 3202.

(23) *Cotton Tufts* in the Memoirs of the American Academy of Arts and Sciences, Vol. I. Boston, 1785, and in the London Med. Journ. Vol. VII. Part III. p. 305, 1786.

(24) *Schmucker* Fasciculus admirandorum naturæ. Strasb. 1697, p. 5, No. 4.—*Rudolphi,* Bemerkungen—auf einer Reise, u.s.w. Part I. p. 71. Part II. p. 200, describes one such from the Cabinet of Natural History at Vienna, and another at Brunswick.—*Osiander* Epigrammata in diversas res musei sui anatomici. 2d edit. Gött. 1814, p. 155, pl. 6.—My Selt. Beob. II. p. 10, of a female roe; I however possessed for a short time the head of a male roe, of which one of the horns sent off a somewhat longish bottle-like process; the head of the so called roe-king is found also in the Anat. Mus. at Berlin.

§ 124.

The PARIETAL BONES are very frequently deficient, either entirely or partially in anencephalous monsters; they are, however, occasionally missed in natural fœtuses.[1] In rare cases they are divided by an irregular transverse suture into an upper and lower-half;[2] we have, however, seen the suture in one instance run partially vertical[3] and diagonal.[4] Its form

participates in almost all the changes of the skull, so that it is sometimes found unequal, oblique, remarkably large in watery head, &c. We sometimes observe the groove for the longitudinal sinus, not in the middle beneath the sagittal suture, but running along only one of the parietal bones; the edges of this groove are also seen very prominent, like a kind of bony sickle. Frequently very deep pits are found, indeed even bladder-like depressions from the so-called pacchionic glands;[5] sometimes the parietal holes, *foramina parietalia*, are very large.[6] If in the bloody tumours of the heads of new-born infants, the effused blood remain for any length of time upon the parietal bones, on that spot is the external table easily destroyed.[7] Finally, the parietal bones, on account of their position, are especially subjected to injuries;[8] this applies to animals with the prominent *crista longitudinalis*, also especially in that part, which therefore very frequently exhibits bendings and fractures.[9]

(1) *Löffler* in *Stark's* Neuem Archiv für die Geburtshülfe, Vol. I. p. 422; and *Stark, ib.* p. 423, note.

(2) *Winslow* in *Tarin* Osteographie, p. 16, pl. 5.—*van Doeveren* Observ. academ. p. 195.—*Murray* resp. *Schulzen* Descriptio fœtus hydrocephalo interno correpti. Upsal. 1797. Compare *Rudolphi's* Schwed. Annalen, Vol. I. Part I. p. 119.—*Meckel* relates one case from the collection of *Gotthard*, and two of his own. Handbuch der pathol. Anatomie, Vol. I. p. 337.—*Hesselbach* Beschreibung der pathol. Präparate zu Würzburg, p. 3. No. 43.—*von Sömmerring* in *Tiedemann's* and *G. R.* and *Chr. L. Treviranus* Zeitschrift für Physiologie, Vol. II. Part I. p. 1, pl. 1 and 2. The suture sometimes does not pass completely through. v. *Aurivillius* resp. *Ekmark* de hydrocephalo 45 annorum. Upsal. 1763. In *Sandifort* Thes. diss. Vol. II.

(3) *Aurivillius.*

(4) *Hesselbach.*

(5) My Verzeichniss, No. 3082.

(6) *Jancke* De foraminibus calvariæ eorumque usu. Lips. 1762.—*Lobstein* D. de nervis duræ matris. Argentor. 1772, Tab. 1, fig. 6.—My Verzeichniss, No. 3083, 3084.

(7) *Michaelis* in *Loder's* Journ. f. d. Chir. Vol. II. Part IV. p. 657, improperly considered the bloody swelling as an original disease of the bone; v. below, on the Head. Cases of such bony erosions are found in *Palletta* Exercit. pathol. 4to. Milan. 1820, p. 123. — *Hesselbach*, p. 145, No. 289. — My Verzeichniss, No. 3122. — *Schwarz* in *v. Siebold's* Journ. f. Geburtshülfe, 1828, Vol. VI. Part II. p. 439.

(8) *Schneider* D. de vulneribus sincipitis. Viteb. 1653.—*Kahl* D. de fracturis ossis bregmatis. Lips. 1776.

(9) I saw a fossil hyæna's skull in *Soemmerring's* Museum, in which the longitudinal crest had been almost entirely broken off and reunited. On the skull of a hyæna striata, No. 4608, in Bresl. Mus. it is very much curved; in dogs I have several times seen it indented, and with united fractures; also curved, in the nasua rufa.

§ 125.

The OCCIPITAL BONE,[1] in anencephalous and hydrencephalous monsters is often very deficient at its upper part; in the latter case we frequently find in it only one single hole of greater or

less size; in both kinds of monsters we find the occipital bone pressed much backwards and downwards; still, however, after birth the squamous part of the bone is very much driven out by dropsy of the brain; as well also in persons with heavy heads, especially if connected with softening of the bones, the under part of the bones is very much thrust up into the cavity of the skull;[2] sometimes the pressure is so great that we find on the occipital bone a deep impression answering to the first cervical vertebra.[3] We very frequently find the separate bony pieces, of which in the fœtus the squamous part of the occipital bone is composed, ununited at a later period, and therefore large distinct pieces lie in and upon the lambdoidal suture,[4] or the bone is divided by a transverse[5] or more rarely by a perpendicular[6] suture. The occipital spine is sometimes unusually large; the articular processes jut out too much and are too deeply articulated, or are too flat, and at the same time sunk in, oblique,[7] unequal, divided into two surfaces, &c.; in rare cases we find near the articular processes on one or both sides, some which are accessory, that is, processes which are articulated with the atlas.[8] Oftentimes we find the occipital hole malformed, viz. too narrow, too wide, oblique,[9] or in idiots unusually wide and directed backwards, &c. In horses and cattle we find caries of the occipital bone from pressure of tumours in the neck, poll evil, *talpa*.[10]

(1) *Schneider* D. de osse occipitis, ejusdem vitiis et vulneribus. Viteb. 1653.

(2) I have seen this several times in osteomalacy and in rickets; it also often occurs in the skulls of cretins.

(3) For instance, my Verzeichniss, No. 165, 168.

(4) Compare the Catalogue of Bresl. Mus. No. 194, 208, 211, 217, 225, &c.

(5) *Eustachius*, tab. 46, fig. 8.—*Albinus* De sceleto, p. 131.—*Albrecht* in Nov. Act. Nat. Cur. Vol. IV. Obs. 13, p. 70. Vol I. fig. 7.—*Bruns* Observat. anat. et chir. med. Götting. 1760. rev. in *Sandifort's* Thesaurus Diss. Vol. III. p. 65.—*Schreiber* in Nov. Comm. Acad. Petropol. Vol. III. p. 395, pl. 9.—*Blumenbach* Geschichte der Knochen. Part II. p. 186, note c. — *Rudolphi* Schwed. Annalen. Vol. I. Part I. p. 119, note. — *Meckel* Handb. d. pathol. Anatomie. I. p. 320.—*Kelch*, Beitr. z. pathol. Anat. p. 2. No. 2.—*Bleuland* Descript. Mus. anat. p. 226. No. 1177; one instance in Bresl. Mus. No. 202; in the anat. pathol. Museum at Vienna, and in the anat. Museum at Heidelberg. Deep notches on either side are common.

(6) *Vesalius* De corp. hum. fabrica. Lib. I. cap. 6, p. 26, the edition by Albin; *Reisel* in Eph. Nat. Cur. Dec. II. Ann. II. p. 274. A notch often remains for a long while above in the lambdoidal angle.

(7) In long-continued wry neck the whole base of the occipital bone is often awry. v. *Bleuland*, p. 238. No. 1241.

(8) *Sandifort* Exercit. acad. Vol. I. p. 10. — Mus. anat. Vol. II. plate 14, fig. 31.—*Leveling* Observat. anat. rarior. p. 134, tab. 5, fig. 2 (hardly more than facettes on the occipital bone, and the tubercles on the Atlas;—*Meckel* De duplicitate monstrosa, p. 24, in D. Archiv f. d. Physiol. Vol. I. p. 644, pl. 6, fig. 37; and in Anat. physiol. Beobacht. und Untersuchungen, p. 178.—*Tesmer* præs. *Rudolphi* D. Observat. osteol. Berol. 1812, with plates; three cases, in Bresl. Mus. No. 166, 167, 8292. — *G. Sandifort* Mus. anat. Vol. III. p. 289, No. 987.—

Knape also possesses such a skull. v. *Schupke* De luxatione spontanea atlantis et epistrophei. p. 21, in note. 4to. Berol. 1816.

(9) I have seen several instances of this, also some in brutes; to wit, Selt. Beob. I. No. 10 and 11; since that time several more; five instances are related by *Meckel* in his Anat. phys. Beobact. p. 173.

(10) I have seen instances of this at Alfort, and large exostoses, from similar causes, on the skull of a horse in the veterinary school at Stockholm.

§ 126.

The TEMPORAL BONES also exhibit many vices of formation; to these belong the partial deficiency of the squamous portion in anencephalous monsters, their exceeding smallness, approximation to each other, consolidation and deficient formation in monsters with imperfect face, particularly with cyclopy and want of the lower jaw;[1] further, the division of the squamous portion into many pieces;[2] its lengthening forwards, so that it joins itself with the frontal bone;[3] deficient formation of the zygomatic process,[4] &c. In anencephalous monsters, and in watery heads, owing to the lateral extension of the head, the petrous bones, instead of being sloped, are completely transverse, and in the latter disease the petrous bone and squamous portion are more or less pressed upon each other.[5] In rarer cases the groove for the transverse sinus in the temporal bone is deficient;[6] the edge of the petrous bone sometimes in insane persons projects as a cutting bony plate;[7] the carotid canal becomes narrowed, in consequence of the smallness and obliteration of the carotid artery, and is even found completely closed;[8] the styloid process is remarkably large and becomes bony;[9] the glenoid cavity is naturally wanting at the same time with absence of the lower jaw, and in gouty persons is entirely bereft of its cartilage; frequently surrounded with *tophus;* a new articular cavity has been once found produced after dislocation of the lower jaw.[10] In rare cases we find in man, unusual openings and canals in the temporal bone for veins, which run out from the transverse sinus.[11] The temporal bones are frequently found carious[12] in consequence of primary diseases of the ear, of abscesses of the brain, which burst here, from metastasis, from superjacent tumours, &c.; we have also once seen a very large exostosis on each temporal bone.[13] As to those parts of the temporal bone which belong to the ORGANS OF HEARING, we find them as a rare congenital condition malformed in various ways, that is, as in the small fœtal state, deficient in certain parts, consolidated together, &c. We observe the bony passage of the ear, in congenital closure and deficient development, sometimes very short and narrow, and it is also said to be compressed in later years, in such persons as have lost their back teeth.[14] The drum is in rare

cases too small,[15] malformed, with consolidation of both auditory organs, also in deaf and dumb persons;[16] on the contrary, too large and very frequently rough and broken down by *caries*. The auditory bones, in rare cases, are all[17] congenitally wanting, occasionally only some of them, viz. the hammer and the anvil,[18] or merely, the hammer[19] or the anvil;[20] sometimes we notice supernumerary auditory bones in man and animals;[21] in other cases they are too small,[22] too large,[23] malformed in various ways,[24] united with each other and with the neighbouring parts,[25] lost from suppuration, separated by dropsy of the head, &c.[26] The parts of the bony labyrinth also are, in rare cases, very much malformed, particularly in deaf and dumb persons;[27] we have also seen the round and oval holes wanting at the same time,[28] or merely the round[29] hole, or the oval hole,[30] or the latter too narrow;[31] the cochlea has a turn too little,[32] or it is too small, so that the promontory in the drum is deficient;[33] in one deaf and dumb person the semicircular canals,[34] merely, were wanting, in an otherwise perfect ear, &c.

(1) I have noticed this in a great number of human and other animal monsters. Compare further down on the Ear.—*E. H. Weber* has lately described a few instances of consolidation of the organ of hearing, in the Zeitchrift f. Physiologie by *Tiedemann, H. R.* and *L. C. Treviranus*, Vol. II. Part II. p. 305, pl. 15.—A skull of this kind is described in *Sandifort's* Mus. Anat. Vol. III. p. 293, No. 1004.

(2) *Meckel* Handb. der pathol. Anatomie, Vol. I. p. 339.—I have similar instances before me.—*Kelch*, Beitrage zur pathol. Anat. No. 4, saw the mamillary parts divided from the squamous by a suture.

(3) *Chizeau* in *Roux* Journ de Médec. Dec. 1772.

(4) In a cretin it was so short as to form no zygomatic arch. v. *Prochaska* Disquis. Anat. phys. organismi c. h. tab. 8.—Deficiency of the zygomatic arch, in consequence of congenital tumour in this region. My Selt. Beobacht. II. p. 162.

(5) *Blumenbach*, p. 151, note 1.

(6) The Review of *Rosenmüller* De singularibus et nativis ossium c. h. varietatibus, in the Ergängungsblättern zur Hall. allg. Litt. Zeitung, 1813. No. 101.

(7) *J. E. Greding* Sämmtliche medic. Schriften, u.s.w. p. 293.—My Selt. Beob. I. p. 73. No. 3—74. No. 7.

(8) So narrow, that it would hardly admit a pig's bristle. v. *Tode* Medic. chirur. Biblioth. Vol. X. p. 407; entirely closed in a preparation in the Anat. Mus. at Dresden.

(9) So that it could easily be broken.—*Blumenbach*, p. 139, Note n, had one which was an inch and a half Paris measure; in No. 144, &c. almost two inches; in No. 245, even three inches long; two inches, and two inches and a half long, v. *Sandifort's* Mus. Anat. Vol. III. p. 289, No. 988 and 989. [There is a very remarkable skull in the Mus. at St. Thomas's Hospital, in which the styloid processes are of great length, and each has articulated on its point a bone which occupies the place of the stylohyoideal ligament, and joins the tongue-bone, which is thus connected by bone to the skull, as in many animals. T.]

(10) *a Loder* Index Præparator. Absch. XI.—*Sandifort*, No. 594, p. 283.—[There is another instance in the skull of a New Zealander, No. 78, Mus. Roy. Coll. Surg. T.]

(11) My Selt. Beob. II. p. 69, No. 31. b.—There can be no question that this variation of structure, so important to practical surgery, is, in most mam-

malia, connected with the existence of the canalis venosus. v. De Animalium quorundam, per hyemem dormientium, vasis cephalicis et aure interna in Nov. Actis phys. med. Acad. N. C. Vol. XIII. F. I.

(12) *Morgagni* Epist. anat. XIV. — *Mohrenheim* Beobacht. verschied. chir. Vorfälle, I. p. 98. — Mémoir de l'Acad. de Paris, 1754, p. 63. — *A. Duncan*, in Medic. Commentaries, II. p. 286. — *Schuhmacher* Medic. chir. Bemerkungen, I. p. 301.—*Weidmann* Ueber den Missbrauch des glühenden Eisens, pl. 5 and 6.—*Palletta* Exerc. pathol. p. 2. — *Brodie*, in Transact. of a Soc. for the Improv. of med. and chir. Knowledge, Vol. III. p. 106. — *Parkinson* in London medic. Repository, Jan. 1817.—*O'Brien*, in Transact. of the Association, &c. Dublin, 1818. Vol. II. — *Thiele* in *Rust's* Magazin f. d. ges. Heilkunde, Vol. II. Part I. p. 164.—*Starke*, *ib.* Vol. II. Part II. p. 311, the pus escaped through the foramen mastoideum. — *Rust*, Vol. IV. Part I. p. 197. — *Neumann* in *Hufeland's* Journ. No. 2, p. 6. July, 1824, the pus escaped through the glasserian fissure in the articular cavity for the lower jaw; and *Ib.* No. 12, p. 14, from an adjacent steatom.—*Duncan*, jun. in Edinb. med. and surg. Journ. July, 1821, Vol. XVII. in three instances. — *Itard* Traité des malad. de l'orielle, etc. p. 70.—*Dorn* in *Hufeland's* Journ. 1822, Part II. p. 76. — *Lallemand* Recherches anatomico pathologiques sur l'Encephale et ses dependance. 8vo. Paris, 1824—1829.—*Raikem* in Répert. génér. d'Anatomie et de Phys. pathol. Vol. I. No. II. p. 295.—My Selt. Beob. II. p. 96.—Verzeichniss, No. 3225—3231. — *Kimmel* præs. *Birkholz* D. observatio anat. pathol. de canali carotico carie syphilitica exeso. 4to. Lips. 1805, with engravings.—*Holst* in Magazin for Naturvidenskabere. Part I. Christiania, 1825. — *Martin*, in Journ. de Médec. Vol. XXX. p. 453.—*G. Sandifort* Mus. anat. Vol. III. No. 927, p. 278.

(13) *Petit* found one hard and like ivory, of the size of a melon.

(14) *Larrey* in the Journ. Compl. du Dict. des Sc. Médic. Vol. XIII. p. 308.

(15) *Rudolphi* found it very much diminished, and the pyramid especially wasted in a man. Physiologie II. p. 148, note 2.—I have found it very small in several cyclopic monsters. v. my Selt. Beob. I. No. 12.

(16) *Rudolphi.*

(17) I have also found this simultaneous with deficient face; since then, in some imperfect auditory organs in animal monsters.

(18) *Caldani* Ep. ad *Hallerum*, Vol. VI. p. 142.—*Scarpa* De structura fenestræ rotundæ auris, etc. p. 84. Mutin, 1772.

(19) My Selt. Beob. I. No. 10 and 11.

(20) *Boneti* Sepulchretum anat. Lib. I. p. 19. Obs. 4.—*Marin. Mersennus* Epist. ad *Beverwyk* De calculo, p. 80.

(21) *Cassebohm* Tractat. VI. de aure humana. Halæ, 1734, p. 55. *Teichmeyer* Vindiciæ quorundam inventor. meorum anat. Jenæ, 1727. rev. in *Haller's* Disp. Anat. Vol. IV.—*Eustach* tab. 7, fig. 3, (in a dog.)—*Adair* in *Cowper* Myotomia reformata. fol. London, 1694, p. 70, fig. 9.—In a preparation belonging to Professor *Römer*, at Vienna, there is a long cylindrical intermediate bone between the malleus and incus, which are separated from each other.

(22) In a deaf and dumb child, three times too small, *Bailly* v. *Boneti* Sepulchretum, Vol. I. p. 19, Obs. 4, § 3.

(23) *Cotunni* De aquæductibus auris humani. Neap. 1760. § 72, concomitant with a closed fenestra rotunda.

(24) *Haller* Elem. Physiol. Vol. V. p. 209, 213.—*Rudolphi*, p. 128, note.—The stapes has been seen with only one leg, or without any opening in it.—*Comparetti* Obs. anat. de aure interna comparata. p. 24, Obs. 13. 4to. Patav. 1789, in two cases.—*Cassebohm* Tractat. sextus de aure monst. hum. tab. 6, fig. 18. Halæ, 1735.—*Tiedemann* in *Meckel's* D. Archiv für d. Physiologie, Vol. V. Part III. p. 349.—In other instances one leg of the stapes does not reach its base. *Lösecke* Obs. anat. chir. p. 15. 4to. Berol. 1754.—*Rudolphi* in *Tesmer* D. s. Observat. osteologicas. tab 1, fig. 15. 4to. Berol. 1812.—An exostosis on an incus, v. *Hesselbach* Beschreib. der pathol. Präparate zu Würsburg. No. 370.

(25) *Valsalva* De aure humana. Cap. II. § 10, p. 52.—In consolidation of both organs of hearing, several of the small bones are also at the same time, in

many instances, anchylosed together. v. My Selt. Beob. I. No. 10 and 11, and since then in several more cases.

(26) *Blumenbach* Geschichte und Beschreibung der Knochen. 2d edit. p. 151, note 1.

(27) *Mundini* Comment. Bonon. Vol. VI. Anatomia surdi nati. p. 422

(28) *Roederer* Descr. fœtus par. in Comm. Soc. Götting. IV.

(29) *Roederer.*

(30) *Cotunni.*—I also saw the same at *Römer's*, in a preparation from a deaf and dumb boy.

(31) My Selt. Beob. I. No. 12.

(32) *Mundini.*

(33) In the case of *Römer's* at Vienna.

(34) *Mürer* Comm. de causis cophoseos surdomutorum indagatu difficilibus. Haffn. 1825.

§ 127.

The SPHENOID BONE presents numerous varieties in reference to its form, which partly depend on the size of the *fossa basilaris;* in cyclopic, anencephalous, and dropsical-headed embryons, it is commonly not only very much malformed, but also perforated and divided in its body, perhaps in consequence of the water bursting out[1] from the cavity of the head at this part. The depth and width of the Turkish saddle varies very considerably, and often becomes very much enlarged by swelling of the cerebral appendage, (pituitory gland) as well as by dropsy of the head.[2] We frequently find the body of the sphenoid bone, as well also as other parts of it, softened, rough, and broken up.[3] The sphenoidal sinus in rare cases is indeed completely deficient, or it is very small and undeveloped; to this belongs that state, in which it is filled by a kind of diploe;[4] often it varies in having a partition; sometimes we observe it communicating by openings with the skull;[5] at other times it is unusually distended by diseases, and its roof raised like a bladder towards the cavity of the skull.[6] If the optic nerve waste in man and animals, the optic hole in the sphenoid bone becomes distinctly narrowed.[7]

(1) My Selt. Beob. I. p. 41, ff.—*Klinkosch* Pr. quo anatomen partus capite monstroso proponit. 4to. Prag. 1766, rec. in Diss. med. select. Pragens. Vol. I. No. 12, p. 199.—*Béclard* in Bulletin de la Facult. de Médec. Vol. III. p. 292, note 9.

(2) I have myself observed this several times. I also saw in the Pathological Mus. at Vienna, a large bladder-like elevation of the Turkish saddle, from induration and hydatids in the pituitary gland.

(3) Especially in epileptic persons; v. *Jos. Wenzel* Beobacht. über den Hirnanhang fallsüchtiger Personen. 4to Mainz, 1810. — My Selt. Beob. I. No. 31, p. 72; at the same time in several individuals; I also once found the sphenoid bone excessively soft in a syphilitic person. It is often very much destroyed by tumours in the skull and orbit, by large nasal polyps, &c.; also at the same time with part of the petrous bone.—*Monro's* Morbid anatomy of the human gullet, stomach, and intestines, &c. Cap. III. sec. 7.—*Klein* in *v. Gräfe* and *v. Walther's* Journ. f. die Chir. Vol. III. Part IV. p. 621. — My Selt. Beob. II. p. 92, No. 39.—A syphilitic caries of the body of the sphenoid bone

is engraved in *Sandifort's* Mus. Anat. II. tab. 20, fig. 2.—A necrotic destruction in *Weidmann* Ueber den Missbrauch des glühenden Eisens. pl. 3 and 4.

(4) Compare *Blumenbach*, § 69, p. 170 ; I have sometimes seen it deficient.

(5) *Haller* Icones Fasc. IV. Tab. narium intern. Vol. II.—*Kelch* Beiträge zur pathol. Anatomie, No. 7.

(6) In a syphilitic person I once saw it expanded to the size of a walnut, in consequence of the purulent fluid contained in it.—*Horn* saw it very much expanded towards the cavity of the skull in an epileptic person. v. Archiv f. d. Medic. Erfahr. 1815, Part V. p. 854. In professor *Vithusen's* Collection at Copenhagen, I saw the skull of a person forty years old, deformed since childhood by the uncommon expansion of the occiput; between the inner and outer tables of the occipital bone is a hollow space an inch and a half deep, which is connected by the pars basilaris with the sphenoidal sinus; the clivus and Turkish saddle are by the expansion of the sinus very much elevated.

(7) *v. Sömmerring* saw this in a horse and in a squirrel. v. *Blumenbach*, p. 38, note z.

§ 128.

The ETHMOID BONE is not unfrequently very defective in monsters with imperfect or entirely deficient face, and merely consists of the crybriform plate, which is found membranous, cartilaginous, and imperforate.[1] In other cases, and indeed commonly in anencephalous monsters, we find large holes instead of the crybriform plate, through which probably the water has burst out from the cavity of the skull;[2] also at a later period the crybriform plate appears sometimes to be partially destroyed, in which case, water, pus, or blood, percolate from the skull through the nose.[3] In congenital rupture of the brain into the nose, the ethmoid bone must be very imperfectly formed; sometimes the crybriform plate lies unusually deep.[4] The ethmoid bone also exhibits various irregularities in other respects, viz. an oblique partition, too few and small, or morbidly large cells, the paper-like bones entirely or for the most deficient,[5] or divided by a suture into two portions,[6] &c. Finally, the ethmoid bone is very often completely or partially destroyed by nasal polyps, by scrofulous tumours, syphilitic caries, and mechanical injuries.

(1) My Selt. Beob. I. p. 31 and 34.

(2) *Osiander* Series observat. de homine quomodo fiat et formetur, read on the 3d of September, 1814, in the Göttinger Socieät der Wissenschaft; my Selt. Beob. p. 44.

(3) *Burdach* Beiträge zur nähern Kenntniss des Gehirns, u. s. w. Leipz. Vol. I. p. 288, and Vom Baue und Leben des Gehirns, Vol. III. p. 80.—*Abercrombie* Pathol. and pract. researches on the diseases of the brain and spinal cord. 2d edit. 8vo. Edinb. 1829.

(4) I have seen this in several persons with watery heads, and in epileptic patients, probably produced by the pressure of the water.

(5) *Kelch*, No. 6.—*Meckel* Pathol. Anatomie, Vol. I. p. 345.

(6) *Hunauld* Mém. de l'Acad. des Sc. 1740, p. 527.—*Meckel.* I have also some such instances before me.

§ 129.

The BONES OF THE FACE taken collectively, present not unfrequently the most manifold variation in reference to number, form, connexion, &c. as they naturally take the most remarkable part in the different malformations of the face. Sometimes in monsters, NO TRACE OF BONES OF THE FACE is observed in the bony capsule enveloping the brain;[1] next there is formed in certain cyclops only an imperfect orbit, as a rudiment of the face, beneath which it develops itself always more and more gradually, from the frame-work of the upper jaw, with or without a lower jaw. The entire deficiency or unusual smallness of the orbits and of the bony nostrils, the partial consolidation of both lateral halves of the face in cyclopy, the mostly very remarkable smallness of the frame-work of the upper jaw in monsters with deficient lower jaw and similar vices, produce very naturally a great deformity in the bones of the face. Sometimes the upper jaw is monstrously short, although perfect in its particular parts; to this belongs, for instance, the deformity occurring in the so-called pug-nosed carp.[2] In rare cases the upper jaw is thus short in animals on account of deficiency of the intermaxillary bones.[3] To these imperfect formations of the bony face, is opposed the EXCESS OF FORMATION in these parts, which we observe in double monsters, with two more or less perfectly formed faces on one head,[4] as also in malformed embryons with monstrously large frame-work of the jaws.[5] Great deformity of the bony face occurs also in congenital CLEFTS, which, as in hare-lip and wolf's-mouth, affect only the upper jaw and palate bones, which parts are more or less separated from each other; but in rare cases the cleft also extends from the margin of the jaw into the cavity of the orbits, ears, and skull.[6] Frequently the symmetry of the two halves of the bony face is disturbed, and the FACE BECOMES MORE OR LESS AWRY;[7] this malformation is sometimes original;[8] more frequently it is produced by mechanical injuries, and by palsy, eruptions, face-ache, &c. on one side, also by the early loss of the teeth on one side, or unusual increase of the incisive teeth of gnawing animals. In such cases the upper and lower jaws are commonly found bent back on different sides, and more or less crooked.[9] Great malformations and destruction of the bones of the face arise from various diseases of the face, especially from tumours in the orbits, nostrils, and mouth, which easily force asunder or destroy the bones. Finally, we observe not very seldom the various fractures of the bones of the face, even although the injury has not operated immediately on them, but

on the skull.[10] We must not confound small fissures with irregular sutures or with sutural bones,[11] which although more rarely than in the skull, occur also in the bones of the face.

(1) For instance, No. 2949—2951, 3044, 8021, of Bresl. Mus.

(2) *Mayer's* Vorstellungen allerhand Thiere, Vol. I. pl. 8.—*Voigt* in Magazin für die Naturkunde, Vol. III. p. 515.—In Silesia they are not rare; v. my Selt. Beob. I. p. 51, tab. 1, fig. 2, and Verzeichniss der Breslauer Sammlung. No. 3009, 3048—50. In the collection formerly belonging to Minkwitz (now at Warsaw) I saw two pug-nosed carp and three skulls of the same; sometimes are the parts of the mouth extended into a kind of proboscis; v. *de Reaumur* in Mémoir. de l'Academ. des Sc. 1747, p. 58.—*Hamberger* de cyprino monstroso rostrato. Jenæ, 1748.

(3) In two sheep, v. my Selt. Beob. I. p. 31. No. 10, p. 34. No. 11.—In a dog, in *Sandifort's* Mus. Anat. Vol. III. p. 375, No. 533.

(4) The least extensive degree of duplication is seen in a calf's skull, of which the snout is too broad; and above, between the intermaxillary bones, are two other accessory bones; as also in the lower jaw, a middle piece, which supports three incisive teeth. *Sandifort* Mus. Anat. Vol. III. p. 295, No. 1012.

(5) At Alfort and Paris, I saw the skull of a horse, the front jaw of which projected far before the hinder.

(6) *Klein* Monstror. quorundam descript. p. 5. Stuttg. 1793. — *van Doeveren* Obs. acad. Cap. II. p. 46, tab. 5. — *Meckel* Handb. der pathol. Anatomie, I. p. 523, in a calf, even into the ear.—*Nicati*, Spec. de labii leporini congeniti natura et origine, Utrecht, 1822, gives an instance of a cleft which passed from the mouth to the eye, from *Vrolik's* collection.—I have seen a similar case, v. my Selt. Beob. I. p. 19.

(7) In the Veterinary School at Stockholm, I saw in the skull of a young horse, the whole upper jaw remarkably bent to one side. I have the same before me, in the skull of a doe, No. 8225. In both instances the cause is unknown. There is also one example from the duck, in Bresl. Mus. No. 3238. There is a remarkable variety of the duck, the anas adunca, or curvirostra, in which the whole bill is strongly bent downwards. An instance of a goose is to be found in the Eph. Nat. Cur. Dec. I. Ann. IV. and V. Obs. 181, p. 226; and in Bresl. Mus. No. 2319.

(8) Especially in double monsters. v. my Selt. Beob. Part I. No. 10—13; in a double-headed calf, No. 3032, in Bresl. Mus. — *Wirtensohn* D. duorum monstrorum duplicium humanor. descriptio anat. p. 6, tab. 1. 4to. Berol. 1825. However, also, in single monsters, v. *Ullersperger* Pathol. anat. Beschreib. sweier Missgeburten. p. 44 and 45, fig. 2. 8vo. Würzburg, 1822.

(9) This especially occurs in birds; for instance, in the crow and lark. v. *Rudolphi* Bemerkungen auf einer Reise, Vol. I. p. 94. — I have also found it in fowls, and in a crow, v. No. 2320, 3240, and 8066.—And I saw it on both heads of a monstrous dove, in the Zootomical Museum at Paris.—In a young turkey. v. *Sandifort's* Mus. Anat. I. p. 306, No. 36. — [In Mus. Roy. Coll. Surg. No. 2, the mandibles decussate in a fetal chick, like those of the crossbill. T.]

(10) *J. Clocquet* Mémoire sur les fractures par contrecoup de la machoire supérieure. 8vo. Paris, 1820, with an engraving.—[*J. Abernethy*, in his Lectures on Anatomy, &c. mentions a case in which the bones of the face were torn off from the skull, at the transverse suture, and left hanging merely by the optic nerves. T.]

(11) For instance, between the frontal and nasal bones. v. *Meckel* Pathol. Anat. Vol. I. p. 346.—*Béclard* in the Bulletin de la Facult. de Médec. Vol. III. Ann. IX. p. 292.—I have some instances before me; viz. No. 165, 177, 191, 203, and 244, of Bresl. Mus.; between the nasal bones, *Meckel* D. Archiv. f. d. Physiol. Vol. VII. p. 107; between the palate bones, *Ib.* p. 154; between the lower end of the lachrymal bone and the upper jaw, viz. No. 204, in Bresl. Mus.

§ 130.

The UPPER JAW BONES are either entirely or merely partially deficient in monsters with imperfect development of the face, or finally, they are but unusually small and malformed. Among their malformations, the most common is the cleft[1] present in hare-lip and wolf's-mouth, which runs through the edge of the jaw either on one or both sides, where the intermaxillary are naturally connected with the upper jaw bones, and in the palate prevents, either only on one or on both sides, the junction of the palatine process with the nasal partition. Should the cleft be large, the palatine portion of the upper jaw-bone is sometimes entirely deficient. In rare cases the palatine processes are so long, that they form the palatine spur. The nasal processes, with deficient nasal bones, are so large that they supply their place; the front part of the same forms externally even a deep fork;[2] that part also of the nasal process which surrounds the lachrymal sac, forms in many skulls a particular piece of bone.[3] The alveolar process differs unusually in form, according as the teeth are absent or present, is large or small, straight or oblique. Sometimes instead of one infra-orbitar hole, there are two, three, and even four.[4] The maxillary sinus is either entirely wanting or very small, according to the imperfect development of the bones; still, however, although these are perfect, the cavities may be very much diminished or even entirely destroyed by great contraction of the bones;[5] in one syphilitic patient, both cavities were at the same time filled up with a loose bony cellular tissue, very plentifully supplied with fat;[6] more frequently we see it very much enlarged and expanded like a bladder, with pus[6*] and water, with polyps, &c. The upper jaw bones are most frequently, of all the bones of the face, subject to diseases which more or less destroy them; for instance, to erosion and breaking up by polyps in the nasal and maxillary cavities,[7] to caries,[8] to spina ventosa,[9] to exostosis,[10] to osteosarcom;[11] more rarely to necrosis.[12] In the animals which have the upper jaw covered with a horny skin, that sometimes presents a morbid appearance, viz. irregular enlargement,[13] clefts, swellings,[14] &c.

(1) A good engraving of a skull, with a wolf's-jaw, is given in *Sandifort*'s Mus. Anat. tab. 35, fig. 1. — *Paletta* Exercit. Pathol. I. fig. 3. — In the double hare-lip, the middle of the edge of the jaw often projects very much, is oblique, &c.—[*J. Rand*, Observations on the double hare-lip in Trans. of Lond. Med. Soc. Vol. I. p. 159. T.]

(2) This may give rise to a peculiarity in the operation for fistula lachrymalis. v. *Bromfield*, Chirurgical Observat. and Cases, Vol. I. p. 341.

(3) *Rosenmüller* Partium externar. occuli hum. inprimis organor. lacrym. descriptio Anat. p. 57. 4to. Lips. 1797.

(12) Also in animals. — I saw, for instance, in the Zoolog. Mus. at Lund, a walrus, with a large necrosis and exfoliation of the alveolar cavity of one tusk.

(13) At Paris and Alfort, I saw the upper mandible of a hen and of a jay, extremely long, curved, and cleft at the point. In rapacious birds and parrots, which are confined, it easily becomes monstrously long.—*Schiöter* found the upper mandible very much enlarged, elongated, and warty, in one partridge; and in another, the upper mandible converted into a large horn-like knob, curved upwards, besides having horny warts on it. v. Archiv f. Zoologie and Zootomie, Vol. V. No. 7.

(14) v. Bemerkungen über einen monströsen Canarienvogl, u.s.w. 4to. Hamb. 1780, with engravings. — In the Zool. Mus. at Paris, I saw two large ones on a partridge.—A sparrow with a spiral horn on the bill, v. *Sandifort* Mus. Anat. Vol. III. p. 372, No. 511.

§ 131.

The small bones of the face connected with the upper jaw participate with it in its variations from the normal form. Thus we find, for instance, the PALATE BONES, in wolf's-mouth, not connected with each other, and more or less deficient in reference to their palatine portion. In rare cases the palate bones do not touch if the palatine point be formed of the elongated upper jaw bones. In congenital closure of the hinder opening of the nostrils, the palatine bones are very much deformed. They are frequently destroyed by polyps of the nose and throat as well as by syphilitic ulcers. In monsters, with deficient formation of the face, the MALAR BONE is sometimes consolidated,[1] sometimes also it has been found divided into two halves by an irregular suture.[2] The NASAL BONES are sometimes, as a congenital formation, entirely wanting,[3] and are then replaced by the enlarged nasal processes of the upper jaw bones.[4] In many cases there is originally but one nasal bone,[5] in other cases there are two, remarkably small, unequal, oblique, arched, consolidated together,[6] divided into two or more pieces, &c.; in horses, we observe them not rarely pressed in from pressure of the cavesson, even absorbed, so that the openings are merely closed with skin.[7] Frequently are they more or less destroyed by syphilitic caries, polypous and scrofulous tumours in the nostrils, and more rarely in animals, by glanders and farcy.[8] The LACHRYMAL BONES are sometimes entirely deficient, and their place is then supplied by the nasal process of the upper jaw-bone.[9] They are frequently very small, or lie so far backwards, as not to assist in forming the lachrymal canal,[10] the groove in them for which presents also many differences. In diseases of the lachrymal sac, in nasal polyps, &c. the lachrymal bones are easily destroyed.

(1) Viz. in No. 3045 and 8226 in Bresl. Mus.

(2) *Sandifort* Observ. anat. pathol. L. III. p. 9, fig. 7. — *v. Sömmerring* Lehre von den Knochen und Knorpeln. 2d edit. p. 218.

(3) *Roloff* in Mém. de l'Academie des Sc. de Berlin, 1761.—*Marrigues* in Mém. de Mathém. pres. a l'Acad. des Sc. IV.

(4) *Sandifort*, L. III. Cap. X. p. 130. L. IV. Cap. X. p. 136.—Mus. anat. Vol. I. p. 167, No. 101.—*Köhler* Beschreibung der phys. und pathol. Präparate. No. 417, p. 124; No. 540, p. 140.—I have seen an instance of it on the skull of a man from Nootka Sound, in Prof. *Mayer's* Collection at Bonn. In two instances, No. 7080 and 8039, of Bresl. Mus. the left nasal bone does not reach the frontal, but its place is supplied by the broad nasal process of the upper maxillary bone. In cyclopic monsters, which have a proboscis instead of a nose, the upper maxillary bones often lie close to each other, and the distorted nasal bones at the root of the trunk, over the orbits.

(5) As a little loose roundish bony germ, in No. 3047 and 8226, in Bresl. Mus.

(6) Entirely or partially, not unfrequently both; for instance, No. 67, 70, 100, 115, 144, 151, 164, 169, 170, 188, 195, 215, 237, 689, 3175, 3251, 3360, 7068, 7075 and 7130, Bresl. Mus.

(7) In a dog, No. 3245, in same.

(8) *Licht* D. de præcipuis viarum lacrymalium morbis. fig. 1. Argentor. 1776. — *Sandifort* Obs. anat. pathol. L. III. C. X. p. 128. L. IV. C. X. p. 137.—*Meckel* Handb. d. pathol. Anat. Vol. I. p. 345.—On a skull, No. 171, in Bresl. Mus. the left lachrymal bone is entirely wanting, and the right so small, that it does not contribute to the formation of the lachrymal pit.

(9) *Metzger* Curat. chirurg. quæ ad fistulam lacrymal. hucusque fuere adhibita, historia critica. p. 66. Monast. 1772.

(10) On No. 8062, the crista longitudinalis is very strongly developed.

§ 132.

The LOWER JAW is not unfrequently, as a congenital formation, entirely deficient, even although the upper jaw exists.[1] In other similar cases there is only found a shapeless rudiment,[2] this sometimes lies on the neck without any connexion to the skull.[3] Oftentimes is the lower jaw normally formed, but varies in reference to its size and figure; thus, for instance, we find it too small, and indeed too short as well as too small;[4] on the other hand also unnaturally large, and this is sometimes in proportion to a short upper jaw, sometimes in reference to its own proportions only;[5] finally, it is often bent, and indeed particularly upwards, when the upper jaw is monstrously small, or in deformity of the whole face to one and the same side with the upper jaw, or to the opposite side to that with which it is then curved. In rare cases we notice also irregular divisions of the lower jaw,[6] in which, as is well known, there occurs one or two little bony germs in the suture between the two halves of the lower jaw-bone.[7] The form of the lower jaw of man and animals, is often very remarkably changed by the loss of some or all of the teeth; the condyle varies very much in reference to its size, direction, and arching; not unfrequently is its cartilaginous covering destroyed and rubbed off;[8] we find it also covered with gouty tophus;[9] the internal mental spine is in rare cases unusually long;[10] in the skull of a Botocudan there was found a deep pit before and above the chin, in consequence of the pressure of the wood worn in the lip,[11] &c.

VICES OF CONNEXION also occur in the lower jaw, as we find it dislocated, completely or incompletely on one or both sides; but even in man before birth, and in animals in which the two halves of the lower jaw remain usually separate, we observe their uncommonly late consolidation with each other,[12] with the temporal bones,[13] and even with the edge of the upper jaw-bone.[14] The continuity of this bone is easily broken, on account of its peculiar form, by external violence, especially by drawing teeth, indeed even by violent biting.[15] Among the diseases which frequently attack the lower jaw, are especially to be mentioned, caries,[16] and necrosis, to which easily follow the reproduction of the lost parts; further, loosening, spina ventosa,[17] bony tumours,[18] and especially osteosarcom.[19]

(1) *Schubarth*, Comment. de maxillæ inferioris monstrosa parvitate et defectu, Francof. ad Viadr. 4to. 1819, with two engravings, describes several instances in man and animals. — *Kerkringius* Opera omnia anatomica, Obs. 60, p. 122. L. B. 1717. — *Themelius* Comm. med. qua nutritione fœtus, etc. Lips, 1751, and in Fasc. Diss. anat. medic. recus. Amstel. 1764, p. 125, in a sheep. — *Halleri* Opusc. pathol. Venet. 1775, Obs. 58, p. 145, in a sheep.—*Speer* D. de Cyclopia. Halæ, 1819.—My Selt. Beob. II. p. 168.—*G. Jäger* in *Meckel's* Archiv f. Anat. und Physiol. 1826, p. 64, in a fœtus of cervus axis and in a lamb.—*Ib.* 1828, No. 1, p. 71, in a lamb.—*Ullersperger* Pathol. anat. Beschreibung zweier Missgeburten. 8vo. Würzburg, 1822, p. 39, fig. 2.—*Weber* Ueber die Verschmelzung der beiden Gehörorgane in d. Zeitschrift f. Physiologie von *Tiedemann* and *G. R.* and *L. C. Treviranus*, Vol. II. Part II. p. 309, in a calf. — My Verzeichniss, &c. No. 2953—2956, 3013, 3047; also No. 8022, 8069, 8226, of Bresl. Mus., all three from sheep.

(2) *Meckel* Handb. der pathol. Anatomie, Vol. I. p. 523, in a calf.—*Schubarth*, *Jager*, in a lamb.

(3) My Selt. Beob. I. No. 12, p. 38.

(4) I have seen several men and animals with this vice.—Also, in the Anat. Mus. of the University at Vienna, a child, with hare-lip, very small eyes, and very short lower jaw.—In the Anat. Mus. at Heidelberg, a dog, with a short lower jaw, and a monstrous short foot.—A child, on account of the shortness of the lower jaw, could not suck. v. *Moschner* Conspectus partuum in lechodochio Pragensi, etc. Pragæ, 1826, p. 109.—I saw it shorter than the tongue, in a hen in the Zootom. Cabin. at Paris.—[In the Mus. Roy. Coll. Surg. No. 304, a preternaturally short lower jaw, in a young red deer (cervus dama), in consequence of which, the animal was starved, from not being able to press the udder in its attempts to suck.—A short account is given by Lord Egremont, who presented the animal to the College, in which it is mentioned, that this malformation was always found in the white varieties of his red deer, and that they never lived more than a day or two, for the reason assigned above. T.]

(5) By the French, called *Menton de Galoche*, in the Milanese *Geppa*, in England *Underhung*; is often connected with stammering and weakness of intellect. v. *Palletta* Exercit. pathol. I. p. 142.—*Catalan* Mémoire Rapport, et Obs. sur l'appareil propre à corriger la difformité, qui consiste dans le chevauchement de la machoire inférieure en avant de la supérieure, difformité vulgairement nommée Menton de Galoche. 8vo. Paris, 1826, with drawings.—*Köhler*, Beschreibung der anat. Präparate, u. s. w. No. 171, p. 50, mentions a human lower jaw, three inches broad.—Some remarkably large and heavy skulls, I saw in the Anat. Mus. at Florence and Bologna.—A very long hinder jaw in a mule at Alfort.—In birds in confinement which cannot wear out the beak, viz. the parrot, I have often seen the horny covering of the lower mandible uncommonly long; in a

lark, with injured upper mandible, the lower grew uncommonly. v. *Rathke* in *Meckel's* D. Archiv f. d. Physolog. Vol. VII. p. 497.

(6) *Eyssonius*, De ossibus infantis, p. 49, observed a division of the lateral parts of the horizontal branch;—divided in a fowl, v. note 4.—The whole length divided in a full grown sparrow, in the Anat. Mus. of the Surgical Academy at Dresden.

(7) *Ruysch* Thesaur. anat. V. No. 4, p. 45. — *Meckel* Anat. phys. Beobachtungen und Untersuchungen, p. 21. Halle, 1822.—His Deutsches Archiv f. die Physiol. Vol. VII. p. 107. — I found a similar intermediate bone in No. 3012, and some of the same in No. 8031 in Bresl. Mus.

(8) *Leidenfrost* in *Wesener* D. de susurru aurium. 4to. Duisb.1785.

(9) My Verseichniss, &c. No. 3270, 3271.

(10) In No. 788, Bresl. Mus., is the spina mentalis interna, almost half an inch long, thick, and cylindrical.—Compare *Howship*.

(11) In the Anat. Mus. at the university of Vienna; I did not, however, see it in other Botocudan skulls.

(12) *Kerkring* Spicil. anat. p. 55, tab. 8.—*Ruysch* Catalogus Musei. p. 187.—*Morgagni* De sed. et caus. morbor. Epist. XLVIII. Art. 50.—*Meckel* Anat. phys. Beobacht. und Unters. p. 69.—My Selt. Beob. I. p. 6, partially united; in dogs I have found the lower jaw sometimes united.

(13) *Eustachius* De dentibus C. XXVIII. p. 92.—*Columbus* De re anatomica. Lib. XV. p. 484.—*Schenk* Observat. medic. Basil. 1584. Obs. 405, p. 441. —*O'Connor* De stupendo ossium coalitu, p. 4, Oxon. 1695.—*Palfyn* Beschryving der Beenderen. p. 218.—*Banks* and *Solander* saw such a skull at Madeira. v. *Hawkesworth*, An account of Voyages, &c. Vol. III.—*Sandifort* Exerc. academ. Vol. II. C. 5, tab. 5 and 6.—Observat. anat. pathol. Lib. I. C. 7, p. 102.—Mus. anat. Vol. I. p. 149; Vol. II. tab. 16, p. 384, 603; Vol. III. p. 234, No. 615, 616. v. *a Loder*, Index.—*Köhler*, No. 1, p. 3.—*Rénard* of Mayence possessed such a skull, which has been described by *Galette.—Jam. Snell*, in Medic. Repository, Feb. 1825, new series, Vol. III. in a child; one case in Bresl. Mus. No 3262.—*Howship.—Tartra* in Journ. de Médec. contin. Vol. XI. p. 182.—*Rudtorffer* Anhang zur Abhandl. über die Operation der Brüche. No. 9. —*Holscher* in his translation of *Brodie's* Diseases of joints, p. 334, note.

(14) *Rust* in his Magazin f. d. ges. Heilk. Vol. I. Part II. p. 226.—In a carp. —*Hamberger* De cyprino monstroso rostrato. Jenæ, 1748.

(15) In a rabid horse in the Museum at Alfort; the possibility of fracture at the symphysis is doubtful, according to *Boyer*, *Delpech*, and others; it has, however, been once seen, v. *Chollet* in Journ. gén. de Médecine. Vol. LXVI. No. 266, Jan. 1819, p. 80.—Two instances of fracture in Bresl. Mus. No. 3275 and 3276.—A false joint after fracture, v. *Horeau* in Journ. de Médec. contin. Vol. X. p. 195.—*Dubois-Faucon* in Journ. gén. de Médec. Vol. XXXIII. p. 86.

(16) In man and animals it is very common from diseases of the teeth, scrofulous and carsinomatous destruction of the neighbouring glands, of the lower lip, &c. v. No. 3264, 3265, 3268, 3274, of Bresl. Mus.—In a child fatal hemorrhage occurred from caries of the lower jaw, and ulceration of the arteria maxillaris inferior. Edinb. Med. and Surg. Journ. Jan. 1824; v. also *Fenner* Ueber caries des unterkiefers in the Bibliothek for Laeger, &c. Kjöbenhavn, Vol. IV. 1813.—*Sandifort* Mus. Anat. II. tab. 23, fig. 2; tab. 28, fig. 3—5, gives some good plates; he also describes caries of the lower jaw, in consequence of cancer of the lip, v. Vol. III. p. 246, No. 714—717, and in consequence of noma, p. 266, No. 852 and 853; there is also a remarkable case of caries on account of development of hair in the lower jaw, p. 280, No. 933.—Caries in the lower jaw of a dog. v. *Sandifort*, III. p. 185, No. 242.

(17) Particularly common in horses; I have seen several examples of it in the collections of different veterinary schools, viz. Alfort, Berlin, Munich; one case in Bresl. Mus. No. 3166; a similar one from an ox, No. 3167. v. *Rudolphi* Bemerkungen auf einer Reise, u. s. w. I. p. 75.—*Greve* Erfahr. und Beobacht. über die Krankheiten der Hausthiere. II. p. 3.—Of a pig at Utrecht.—*Bleuland* resp. *Reimann* Spicileg. observat. anatom. de Hyäna. p. 12. 4to. Berol. 1811.—In a marmot in *v. Sömmerring's* Museum.

(18) *Mosque* Chirurgische Novellen, u. s. w. No. 10.—My Verzeichniss, &c. No. 3266, 3269.—In the veterinary school at Stockholm, I saw an exostosis, as big as a walnut, with a neck, from a horse.

(19) *Cremoux* in Mém. de l'Académ. de chir. Vol. V. Mém. p. 350.—*Bordenave, ib.* p. 338.—*Morelot, ib.* p. 352.—*Quittenbaum* D. de memorabili quodam maxillæ inferioris fungo scrofuloso. fol. Hannov. 1818, with two engravings.—*Crowfoot* in Edinburgh Med and Surg. Journ. 1825, Oct.—*Cusack* and *Crampton* An account of such tumours removed from parts of the lower jaw in several cases; v. Dublin Hospital Reports and Communications in Medicine and Surgery, Vol. IV. 1827.—*Oudet* in Archives général. de Médec. Jan. 1826, three instances by *Mott*, and one communicated by *Clellan*, *v. d. Busch* in *Langenbeck's* N. Biblioth. f. d. Chir. und Ophthalm, 1827, Vol. IV. Part III. p. 417, *ib.* p. 532, with the editor's additions.—*G. Sandifort* Mus. anat. Vol. III. p. 285, No. 971, p. 348, No. 300.

§ 133.

The TEETH[1] are subject to very many irregular formations and diseases, as they are not merely affected alone, but participate also more or less readily in the diseases affecting the organization of the face.[2] The number of the teeth does not unfrequently vary from that which is normal, inasmuch as in man and in animals, sometimes several,[3] at other times all[4] are deficient, as a vice of formation, sometimes also on the contrary there are supernumerary[5] teeth, two and even three rows;[6] the additional number depends most commonly on the continuance of the milk teeth.[7] We observe many irregularities with respect to the PERIOD OF CUTTING AND CHANGING THE TEETH; in weakly and especially rickety children, the teeth are sometimes either all or some of them cut very late,[8] or in irregular order,[9] and even their change is very much retarded; in rare cases we observe, even in old people, several teeth still to be produced;[10] on the contrary, we notice the too great activity in reference to the formation of the teeth, as they may have been cut before birth,[11] or very soon after,[12] may be changed too early and too frequently;[13] also in very rare cases, when parts of the jaw have been destroyed by caries, necrosis, &c. new teeth are produced in the newly formed bone;[14] so also in a false direction of the formative power, the teeth present themselves not unfrequently in other places than the jaws,[14*] indeed even in encysted tumours.[15] The teeth frequently vary from what is natural in reference to SIZE AND FORM; we thus find not merely the supernumerary, but even some other or all the teeth remarkably undeveloped and small, in consequence of early pressure, rickets, &c.; the normal teeth are also distinctly diminished in consequence of the wearing away[16] and rubbing down[17] of their crowns. Just as frequent is the original irregular size of certain teeth, in consequence of which deformity, displacement and retarded cutting of other teeth is easily produced, as well as the later increase of such teeth as

have not been retarded in their growth by counter-pressure and rubbing down; such teeth often attain an uncommon length, often curve up and penetrate into the neighbouring parts, for instance, into the palate, nose, orbit, and even into the brain.[18] Often also without any increase, the form of the teeth varies in numerous ways, in which case the crown is deformed,[19] the number, length, direction, and curving of the roots varies much,[20] the whole teeth are curved,[21] they present congenital tumours covered with enamel[22] (*dentes proliferi*), and the surface of the teeth is uneven, owing to congenital unequal deposition of the enamel.[23] We very frequently observe in rickety persons, and such as have small jaws, the POSITION and DIRECTION of the teeth irregular;[24] they stand obliquely,[25] are more or less turned round on their axis,[26] horizontal,[27] and even completely turned round;[28] in all these cases the teeth remain frequently for a long time or throughout life hidden in the jaws,[29] they stand unevenly in the edge of the jaw, and are huddled together, and in irregular rows,[30] or they protrude inwards and outwards on the alveolar edges of the jaws,[31] in the upper maxillary sinus,[32] in the nostrils,[33] externally on the upper jaw,[34] on the coronoid process,[35] on the outside,[36] and on the chin[37] of the lower jaw, &c. Not fewer are the variations respecting the CONNEXION of the teeth; thus, in rare cases, we find some of the teeth sticking[38] only in the gums, and without roots or alveolar cavities, or in monsters with deficient formation of the jaws or duplicity of the mouth, some teeth entirely loose or covered by a thin membrane and hanging to the skinny parts of the opening of the mouth;[39] many teeth have uncommonly small roots and alveoli, and easily fall out;[40] this we especially see in the teeth shed by old persons. But perfectly formed teeth are sometimes also, some or all of them, lost and shed unusually early,[41] partly owing to imperfect nourishment,[42] and rapid absorption of their roots[43] and alveoli, partly in consequence of a morbid state of the jaw, whereby their connexion with each other is dissolved.[44] The opposite state, viz. the too close connexion of the teeth with the jaws arises partly from swelling of their roots, but often from their consolidation with the alveoli; we also find in not very rare cases, two[45] or even more teeth,[46] more or less consolidated at their crowns, roots, or completely grown together throughout.[46*] The COLOUR of the teeth also presents many vices; to these belong the different shades of the white colour and lustre which is produced by disease and disposition to it; thus we find the teeth bluish white in the disposition to consumption and rickets; like transparent horn in the hereditary disposition to

herpes,[47] &c. Meat, drink, medicines, and the like, often colour the teeth more or less brownish and blackish;[48] diseased teeth usually become discoloured, yellowish, greyish, even black, brown, as in caries. Very frequently the discolouration of the teeth arises from TARTAR, commonly so called, that is, a mass composed of phosphate of lime and a small quantity of animal matter, which envelopes the teeth more or less completely, attaches itself more or less firmly, assumes a greyish, greenish, brownish, blackish, and even metallic shining colour,[49] and is often deposited in great quantity on the teeth.[50] As to vices of CONSISTENCE, we find the teeth naturally either too soft and friable, or they become morbidly so; the latter vice occurs commonly in a greater or less degree on the roots,[51] and internally carious teeth, but seldom it is found in the whole tooth;[52] in other cases the substance of the tooth is too hard, and brittle like glass, and therefore in consequence of sudden changes of cold and heat, as well as in biting, &c. fissures, clefts, and actual fractures, easily occur, which can only again be united at the lower part of the tooth.[53] Not less are the teeth subject to many VICES OF TEXTURE, notwithstanding the hardness and similarity of their substance; to these belong inflammation[54] and its consequences, as SOFTENING and absorption[55] of the fangs, the swelling,[56] which rarely attacks the whole tooth, but usually only the roots, EXOSTOSIS,[57] and lastly, especially CARIES,[58] which is so usual in man, and also in animals, viz. horses, cattle, house-dogs, &c. Lastly, in very rare instances we meet with EXTRANEOUS BODIES in the teeth, for instance, HYDATIDS in the cavity of a carious tooth,[59] worms commonly so called, that is, the larvæ of insects and infusory animals,[60] and in the tusks of elephants, especially bullets,[61] and in one instance the point of a spear,[62] both of which had perforated the tooth in its young and soft state.

(1) v. *de Plouquet* Repertor. Art. Dens. and Dict. des Sc. médicales, Vol. VIII. Art. Dent.—*Fr. Hoffmann* D. de dentibus eorumque morbis. 4to Halæ, 1698, in Operib. VI.—*Pfaff* Abhandl. von den Zähnen und deren Krankheiten, Berlin, 1756.—*Berdmore*, A Treatise on the disorders and deformities of the Teeth and Gums. Lond. 1770.—*Plenk* De morbis dentium ac gingivarum. Vindob. 1778.—*Jackson* D. de physiologia et pathologia dentium. Edinb. 1778. *Jourdan* Traité des maladies et des operations chirurgicales de la bouche. 2 Vols. Paris, 1778.—*J. Hunter*, The natural history of the Teeth, their structure and various diseases. 4to. London, 1771.—*Walkey*, On the diseases of the Teeth, &c. 1793.—*Bring* Observationes in hodiernam de dentibus præcipue doctrinam. Lundæ, 1793.—*Hirsch* Prakt. Bemerkungen über die Zähne und einige Krankheiten derselben. Jena, 1796.—*Ettmüller* Medic. chir. Abhandl. üb. die Krankh. der Zähne, u. s. w. Leipz. 1798.—*Paldamus* D. de dentium morbis. 4to. Halæ, 1799.—*Hirschfeld* Prakt. Bemerkungen über die Zähne, u. s. w. Gotha, 1801.—*Skinner*, A treatise on the human Teeth, concisely explaining their structure and cause of disease and decay. New York, 1801.—*Fox*, the history and treatment

similar skull, which he gives from *v. Froreip's* Sammlung; I saw a skull of this kind in *J. Brookes's* Museum, London; and also in the Veterinary School and Museum of natural history at Copenhagen.

(6) Several instances in *Haller* Elem. phys. Vol. VI. p. 29.—*Columbus* De re anatomica. L. XV.—*Courtois.* — In my youth, I knew a young man who had two rows of teeth in both jaws.

(7) In a dog, the cuspid teeth. v. No. 3311 of the Verzeich. des Bresl. Mus. In an adult, I found a molar of the first set still remaining.—Here also belongs the milk tooth of a man of thirty-seven years of age, described by *Bloch* Med. Bemerk. p. 19.—*Cerutti* Bescreib. der pathol. Präparate, No. 567.

(8) I have known several instances of children, from two to three years of age, who had not cut a tooth. In one case they were first cut at thirteen years, v. Misc. Nat. Cur. Dec. III. Ann. VI. and VII. Obs. 183.—A very rickety girl, nine years old, at Neurode, had but one tooth in both jaws.—Three instances of want of one cuspid tooth, at the seventh year, are related in *Wichmann* Ideen zur Diagnostik, p. 82. — A rickety child, of ten years of age, in the Bresl. Mus. had only the first eleven teeth, viz. seven incisive and four back teeth.

(9) For instance, the back earlier than the front teeth, v. *Fischer's* Beiträge zur Arzneiwissenchaft, 1776. Part I. p. 80.

(10) Several instances in *Reuss* Repertor. Comment. Vol. X. p. 54.— Sera dentium eruptio.—*Doubois-Faucon* Sur les dents tardives in *Sédillot's* Rec. période. de la Soc. de Médec. de Paris, Vol. XIII. May, p. 73, such teeth have always small sockets.—*Ysabeau* in Journ. de Médec. Vol. XXV. 1766, gives instances in persons of eighty, ninety-two, and even one hundred and twenty years of age.—*v. Sömmerring*, p. 270.—*Pentzius* in *Rust's* Magazin f. d. ges. Heilk. Vol. XXII. Part III. p. 596, in a man of seventy-five years of age.—Deficiency of room, or irregular position, is often the cause of this. In many cases also there is a second change.

(11) *Haller* Elem. Physiol. Vol. VI. p. 19. — *Girardi* Oratio de re anatom. p. 27, note c. 8vo. Parmæ, 1781. — *Baudelocque* Entbindungskunst. 2d edit. Vol. I. p. 222.—*v. Sömmerring*, p. 269. — Louis XIV. was known to have been born with teeth. v. *de Plouquet* Repertor. Dentes præcoces.

(12) A boy with premature puberty, had, in the first year, nine teeth in the upper, but none in the lower jaw. —*South*, in Lond. Med. Chir. Trans. 1822. Vol. XII. p. 1.

(13) *Gehler* Progr. de dentitione tertia. 4to. Lips. 1786.—*v. Haller*, Vol. VIII. p. 22.—*Albinus* Annot. Acad. L. I. tab. 4, fig. 3.—*Hunter*, p. 85.—*Gavard* Osteologie, p. 354.—Med. and Phil. Comment. Vol. III. and VIII.—*Simmons*, in Med. Obs. and Inq. Vol. III. p. 118. — *Dachs* in Verhandelingen te Haarlem, Vol. XVI. D. II. p. 327.—*Hinze* Kleine Aufsätze aus dem Gebiete der Medicin, Chirurgie und Geburtshülfe. Breslau, 1826. — *v. Froriep's* Notizen, Vol. VIII. No. IX. p. 138.—The Armenian, Saas Oglou, had two new back teeth at the age of a hundred, a third in his hundred and twenty-first year.

(14) *Fardeau* v. *Gerson* and *Julius* Magaz. f. d. ausländ Litt. Vol. II. p. 486.—*Harder*, in Petersb. verm. Abhandl. a. d. Geb. d. Heilk. 1823. Vol. II. p. 207.—*Krimer* in *v. Gräfe* and *v. Walther's* Journ. f. Chirurg. 1827. Vol. X. Part IV. p. 606.

(14*) [In Mus. Roy. Coll. Surg., No. 269, a lamb, in which two well formed incisive teeth project between the angle of the jaw and the external auditory passage on one side of the neck, and on the other side a single incisive tooth only. T.]

(15) *Meckel* Ueber regelwidrige Haar und Zahnbildung in his Archiv. f. d. Physiol. Vol. I. Part IV. p. 519.—Compare the several parts below.

(16) Not merely may the roots of the teeth become atrophic, but even the crowns may waste.—I saw this very distinctly in the Anat. Mus. at Lund, in the incisive teeth of a very old horse, which had become exceedingly small. v. *Duval* Mémoirs sur l'atrophie des dents. v. Bulletin de la Facult. de Médec, etc. p. 7. 1812.

(17) The crown is sometimes almost worn down to the neck, without the cavity of the tooth being opened, as a peculiar kind of bony deposit takes place in it v.

Duval Mémoire sur l'usure des dents, p. 6, 1810; and *Prochaska* De decremento dentium in Annot. Academ. Fasc. I. p. 5, tab. 1. [*T. Bell*, p. 188, mentions a case in which the incisive teeth were so worn down, that when the jaws were shut there was an interspace of near a quarter of an inch; the cavities, however, were saved from exposure by the deposit of new bony matter, solid and hard, but so transparent, that nothing but examination by actual contact could convince an observer that they were closed. T.]

(18) I have seen this several times, in the hare, rabbit, catsquirrel, hamster, rat, and mouse, v. No. 3297—3300, of Bresl. Mus. — I lately had two similar hares.—*Moreau de la Sarthe* gives, in his fourteenth plate, an engraving of a rat with a very long and curved incisive tooth. — *Thunberg*, a hare's skull, in the Müncher Akadem. Denkchriften, Vol. IX.—*Cheselden*, a similar case in a wild boar.—The upper tusk of a babyroussa penetrated by its point into the brain. v. *Lobstein* Compte rendu, etc. No. 265, p. 74. Strasburg, 1824.—Two instances of rats. v. *von Froriep's* Notizen, Vol. IV. No. 76, p. 8, and Vol. XI. No. 2, p. 20.—In the last case noticed by *Devergie*, the tooth had passed through the posterior opening of the nostril into the nose, then again through the upper jaw into the mouth, and again up to the orbit.—I saw in the Anat. Mus. at Lund, a horse's mouth, in which a tooth of the lower jaw had grown high up into a hole in the upper.—In elephants, not unfrequently are the tusks curved and spiral-shaped. [In Mus. Roy. Coll. Surg. is an example, No. 12, of perforation of the palate of a dog, in consequence of unnatural situation and length of a lower cuspid tooth on the right side. No. 516, an upper incisive tooth of a rat, which, from want of apposition, has formed one perfect circle and the segment of another.—Similar elongation, and from the same cause, in rabbits, No. 547—549, &c.; in the latter the secondary incisive teeth are also much elongated. T.]

(19) Compressed, awry, &c.—An incisive tooth in the Bresl. Mus. No. 3279, has a roundish and flat crown. — The crowns of the back teeth in dogs, which, for several generations back, have fed principally on vegetable food, lose the points, and produce the flat crown as an hereditary deformity. The palate teeth often vary very much in form; for instance, their crowns are pointed and conical.—*Cerutti*, No. 582, 3282, and 3283, Bresl. Mus.; cauliflower-shaped, v. *Soemmerring*, p. 272; tulip-shaped, *Cerutti*, No. 581; the front molar teeth in adults have four, the hinder five and six tubercles, &c.

(20) Incisive teeth with two fangs, *Rudolphi*, tab. 1, fig. 1 and 3; and No. 3285, 8130, Bresl. Mus.—Cuspid teeth with two fangs, *Rudolphi*, tab. 1, fig. 4 and 5.—*Cerutti*, No. 573, 574.—No. 3285, with three fangs. v. *Fauchart* Der Zahnarzt, tab. 27, fig. 13; the third and fourth molar, with but one fang, (one instance in Bresl. Mus.) or with five or six fangs, v. *Rudolphi*, tab. 1, fig. 6.—Frequently we find them hooked, curved, much diverging, connected at the points, and enclosing a portion of the jaw, the roots very long, &c. No. 3278, 3288, 3292, 3302, 8127, 8133, of my Verzeichniss.

(21) For instance, an incisive tooth bent at an acute angle, and its point directed outwards, No. 3307, of my Verzeichniss.—The tusks of the elephant are often curved and spiral.—Incisive teeth, which are very projecting and curved; as also the persons so provided and called *Bronci*, v. *Mercurialis* Variorum lect. L. VI. C. XIII. [An instance of this kind is No. 615, Mus. Roy. Coll. Surg., in which an elephant's tusk is spirally wreathed, or twisted from the bottom to the top with three circumvolutions, standing between two straight lines; it is also furrowed longitudinally, and parallel to the axis of the tooth. v. *Grew's* Mus. Reg. Soc. p. 31. London, 1681. No. 712, Mus. Roy. Coll. Surg. exhibits the cuspid tooth of a hippopotamus unusually curved. T.]

(22) They usually occur singly, on the neck or crown of the back teeth, rarely several at once, and on the front teeth, for instance, three on one cuspid tooth. v. *Lemaire* in Journ. de Médec. par *Leroux* Vol. XXXVI. p. 254. — Dentes proliferi, are described by *Albinus* Annot. Acad. Vol. I. pl. 4, fig. 3 and 4.—*v. Sömmerring*, p. 275. — *Fox*, Natural history and diseases of human teeth, tab. 13, fig. 1—8. — *Rudolphi* resp. *Tesmer*, p. 10, tab. 1, fig. 7—9. — *Meckel* Tabulæ anat. pathol. Fasc. III. p. 1, tab. 17, fig. 1.—Several instances are found in the Leipzig. anatom. Mus.—I have found several such teeth, v. No. 3287,

8131, 8132, with two excrescences, and 8250.—*Cerutti* Beschreib. der pathol. präparate, No. 565.

(23) Erosion of the teeth, in *Bunon* Expériences et demonstrations, etc. Paris, 1746; and in *Mahon* Le Dentiste observateur. Paris. Ann. VI.—*Atrophie* in *Duval*, p. 7, 1812.

(24) *Dubois-Faucon* De dentium vitiose positorum curatione; Theses anatomico-chirurgicæ. 4to. Paris, 1775.

(25) As resemblances to animals, the teeth very sloping as in cretins; also in pug dogs, uncommonly sloping; further, from the protrusion of the tongue.

(26) In Bresl. Mus. v. my Verzeichniss, &c. No. 3308.

(27) *v. Sömmerring*, p. 272 and 278.—*Dubois-Faucon* in *Sédillot's* Jour. gén. de Médec. Vol. XXXII. May.—*Powell-Blackett*, in London medical Repository, June, 1821. Vol. XV. No. 90, p. 456, with engravings. v. my Verzeichniss, No. 3305, 3308, and 8249.

(28) *Albinus* Annot. Academ. L. I. C. XIII. tab. 4. fig. 1, the cuspid teeth in the nasal process of the upper jaw.—*Sandifort* Observat. anat. pathol. L. III. tab. 10, fig. 1.—*Meckel*, tab. 17, fig. 7.

(29) v. my Verzeichniss, No. 3302, 3303, 3306, 8062.—Such teeth not unfrequently give rise to bony fistulas. [No. 144 and 145, Mus. Roy. Coll. Surg.; in these the right upper cuspid tooth is formed so high in the jaw, that it cannot reach the gum. T.]

(30) For instance, the first molar before the cuspid, *Miel* in *Leroux* Journ. de Médec. Vol. XL. p. 88.—*Meckel*, tab. 17, fig. 2.—The first molar in the place of the outer incisive tooth, and that in its place, *Miel.*—In a wild boar, the first right incisive tooth of the lower jaw in its middle, and the tusk opposite, v. Allg. Historie der Natur. Vol. VII. Part II. p. 232, No. 1384.

(31) *Borellus*, Cent. II. Obs. 81.—*Erndtel* in Actis N. C. Vol. II. Obs. 113, p. 262.—*Schenk* Observat. L. I. No. 411.—*v. Sömmerring*, p. 272.—*Meckel*, tab. 17, fig. 6.—*Hirsch* p. 74.—*Tode* Medic. Journal. Vol. II. Part IV. p. 21.—*Schmidt* in *v. Siebold's* Samml. selt. und auserl. chir. Abhandl. Vol. III. 1812. Part XXII. My Verzeichniss, No. 3282, 3283, 3304.—*Albinus*, p. 53, tab. 4, fig. 3.—*Cerutti*, No. 580—582.—In the horse, not unfrequently wolf's-teeth, dentes lupini.

(32) *Fauchard* in Mém. de l'Acad. de Chir. Vol. V. Mém. 257.—In Anat. Mus. of University at Copenhagen, I saw caries of the bones of the face produced by a molar tooth, which, with its crown outwards, had penetrated the left maxillary antrum; also the fangs of the bicuspid and front molars, sometimes penetrate the maxillary sinus. v. *Bertin* Osteologie, Vol. II. p. 309.—*Portal* Comp. d'Anatomie médical. Vol. I. p. 210, note 2.—My Verzeichniss, No. 3278; there are, in the Bresl. Mus. No. 8128, two teeth, as it were absorbed, which had been drawn out of the maxillary cavity.

(33) In the Anat. Mus. at Lund, I saw an upper jaw, in which an incisive tooth was breaking into the nostril.—Compare *Cerutti.* [No. 143, Mus. Roy. Coll. Surg. the crown of the right upper bicuspis projecting upwards and inwards into the right nostril. T.]

(34) *Albinus*, p. 53.

(35) *Sandifort*, p. 138, tab. X. fig. 5.

(36) *Tesmer*, præs. *Rudolphi*, tab. 1, fig. 14.

(37) *Sandifort.*

(38) *Hunter*, p. 8. [In Mus. Roy. Coll. Surg. No. 1059, is a lower molar tooth, formed only in the gum, and unconnected with the jaw. T.]

(39) I found this several times in monstrous sheep and calves, v. my Verzeichniss, No. 2322, 2323, 2949; further, No. 8021, *Ib.* Mus.—*Schläpfer*, in a calf, in Schweitz. naturwissenchaftl. Anzeiger. No. 1. July, 1819.

(40) *Dubois-Faucon* in *Sédillot's* Journ. gén. de Méd. de Chir. et Pharm. Vol. XXXII. May.

(41) In diseases of cattle the teeth not unfrequently become loose, especially in oxen and sheep; in an epidemic scabious exanthematous disease which affected the cats in Holland in the year 1796, their teeth fell out.

(42) This appears to be the case, as when the second or permanent teeth are shed by a process similar to that which causes the shedding of the horns of stags,

viz. the closing of the nutritive canals in their roots which secrete the bony substance, the destructiou of the vessels and nerves, and thus also of the life of the tooth. I have seen this in several teeth; v. *Pearsons* in New-England Journ. of Medic. and Surg. new series, Vol. IV. Jan. 1820.

(43) *Duval* in Bulletin de la Faculté de Médec. 1811, No. 7—12.

(44) From inflammation, swelling, and suppuration of the internal membrane of the socket, by which the tooth is more or less pushed out and loosened; from destruction of the gums, gumboil, caries, osteosarcom of the jaw, from glossocele, &c. It is self-evident that they may be loosened by mechanical influence of various kinds; an imperfect loosening of this kind, we call, though improperly, dislocation of the teeth.

(45) *v. Haller* Elem. Physiol. Vol. VI. p. 29.—*de Plouquet* Art. Dentis Continuitas.—*Gavard* Osteologie. p. 338.—*Laveran* in *Sédillot* Journ. de Médec. Vol. XXIX. p. 192.—*Courtois*, p. 156.—*v. Sömmerring*, p. 273.—*Hirsch*, p. 77.—*Serre* Praktische Darstellung aller Operationen der Zahnarzneikunst. Berlin, 1804, p. 208, tab. 21.. fig 1 and 2.—*Fleischmann* in Abhandlungen der physik. medic. Societät zu Erlangen. Vol. I. p. 31, tab. 1. fig. 3 and 4.—*Tesmer* Præs. *Rudolphi*, p. 9, tab. 1. fig. 11 and 12.—I saw in a student here two incisive teeth grown together by their crowns; two back teeth with their roots united; v. my Verzeichniss, No. 3280, 3281, 3284.—From a cow, v. *Cerutti* Beschreibung der pathol. Präparate d. anat. Theat. zu Leipzig, No. 586, from man, No. 575, 578.

(46) *v. Haller*, who as well as *Rhodigius* Lection. antiqu. Basil. 1517, L. II. C. XXXIII. p. 78, gives doubtful instances of union of all the teeth. I lately had three incisive teeth of a child united at their roots, No. 8129 of the collection.—*Oudet* found on each side of the lower jaw a large unequal tumour, covered here and there with enamel, which seemed to arise from consolidation of the incisive and cuspid teeth; v. N. Journ. de Médec. Feb. 1821, p. 245. [No. 146, Mus. Roy. Coll. Surg. a molar tooth of the upper jaw anchylosed to that adjoining, which is inverted. T.]

(46*) In the Mus. Roy. Coll. Surg. No. 265, a double human incisor.—No. 266, two tusks of a young elephant growing from the same side of the jaw, closely united throughout, and the cavities containing the pulps communicating laterally. T.]

(47) *Duval* in *Leroux* Journ. de Méd. Chir. et Pharm. Vol. XXXIII. July and August.

(48) To wit, smoking tobacco, chewing betel, the use of sugar of lead. v. *Saxtorph* in Act. R. Soc. Med. Havn. Vol. III. p. 96.—From sulphur baths, *Waiz* in *Hufeland's* Journ. d. prakt. Heilk. Vol. XVI. Part II. p. 33. It is well known that many nations colour their teeth artificially; tooth tinctures containing mineral acids easily colour the teeth dusky.

(49) The black glazing of the hind teeth of oxen, sheep, and goats takes place especially in such animals as feed on dry and rooty fodder; the metallic glazing, like bronze, gold, &c. is often produced from the use of water containing iron. In coppersmiths the teeth are sometimes coloured green, and little particles of metal mingle with the tartar.

(50) Especially in persons with weak digestion, in rickety people, in those which are generally affected by lithiasis; sometimes in uncleanly persons several or all the teeth are united together with tartar, or it surrounds the whole tooth and forms a large tumour. v. *Duval* Le dentiste de la jeunesse. Paris, 1804. I have found many such instances, for example, one as large as a walnut, v. my Verzeichniss, No. 3294, 3295.—*Cerutti*, No. 566, 571.—*Sandifort* Mus. Anat. Vol. III. p. 297, No. 1031.—[There is in the Mus. at St. Thomas's Hospital, a piece of tartar as large as a hen's egg. T.]

(51) *Blumenbach's* Horny substance of the teeth.

(52) In general osteomalacy the teeth usually remain hard, although there are exceptions to this rule; for instance, the case by *Veirac* Abhandlung über die Rhachitis, u. s. w. p. 54 and 83, Stendal, 1794.—*Isenflamm* Versuch einger prakt. Anmerkungen über die Knochen, p. 427.—A tooth resembling cartilage was found by *Krauss* in Mis. Acad. N. Cur. 1697, p. 619.—*le Blanc* Précis des Opérations. Vol. I. p. 18.

(53) *Jourdain* Essai sur la formation des dents. Paris, 1766.—*Duval* in Recueil périodique, etc. Vol. XIII. p. 275, and in Bulletin de la Faculté de Médec. 1811, July, p. 115; Sept. p. 161.

(54) *Plouquet* D. Primæ lineæ Odontitidis, s. inflammationis ipsorum dentium. 4to. Tübin. 1794.—It easily arises out of scrofulous, syphilitic, and gouty causes.—[A very excellent instance of abscess in the bony body of a molar tooth is given by *T. Bell*, in Med. Chir. Trans. Vol. X. p. 38.—Chuny, the elephant, which, a few years ago, was destroyed at Exeter Change, in consequence of his ungovernable violence, arising as was then supposed from sexual excitement, was found, when the bones were macerated, to have been labouring under inflammation of the tusk, probably its pulp, as in the socket was found a quart or two of pus, and on the tusk itself some bony deposit, and an indentation, perhaps produced when the tusk was recently formed, by a blow with a shovel, which had been given him a year or two before, when very unruly. T.]

(55) *Duval* in Bulletin de la Faculté de Médecine, 1811, p. 204.

(56) v. *Duval*, 1811, No. 7—12. — Many instances in Bresl. Mus. viz. No. 3290, 3291, 8126.—*Cerutti*, No. 550—553, 559. – in *Blumenbach's* collection I saw the back tooth of an animal, which, excepting the root, was completely expanded into a large bony tumour.—*Meckel* has figured a similar case of a human tooth; v. tab. 17, fig. 8—10.—*Howship*, Pract. Observat. &c.—*Oudet* in N. Journ. de Médecine, 1821, Févr. p. 245.

(57) Small exostoses on the fangs are not uncommon; v. above, note 22.

(58) *Küchler* D. de ulceribus dentium fistulosis. 4to. Lips. 1733.—*Rengelmann* De ossium morbis, eorumque, in specie dentium, carie. Arnstadt, 1805.—*Duval* in Bulletin de la Faculté de Médec. 1809, p. 104, and 1810, No. 6, p. 86.—*Lavagna* Esperienze e Riflessioni sopra la cari de denti umani. 8vo. Genua, 1812.—Caries also occurs in rare cases in teeth which have not been cut, as well also as in that part of the tooth covered by the gum.—[Perhaps here belongs the case of a large tumour of the lower jaw, with an abscess in the neck, occasioned by supernumerary teeth, related by *Whately*, in Medical Facts, Vol. VIII. p. 173.—The term caries is objected to by *T. Bell*, in his Anatomy, &c. of the Teeth, p. 118; and he prefers calling it gangrene, as it "has not the slightest analogy to true caries of bone."—*J. Hunter* also, in his Natural History of the Teeth, had previously stated that it was "such a decay as would appear to deserve the name of mortification;" though he considers that there is something more than this. T.]

(59) *Heuermann* Bemerkungen, u. s. w. I. p. 302.

(60) v. *de Plouquet* Repert. Art. Dens. Vermiculi.—*Cerutti*, No. 563.—*Kremser* in *Horn's* Archiv f. medic. Erfahrung. July and Aug. 1821.

(61) *Daubenton* in *Buffon*, Vol. XI. p. 161.—*Gallandat* Over de Olyphants Tanden im Verhandelingen der Genootsh. te Vliessingen, Vol. IX. p. 352.—*Bonn* in Descr. Thesauri Hoviani. p. 146.—*Blumenbach* Handb. der vergl. Anatomie. 2d edit. p. 44, in notes.—*G. Cuvier* in Dict. des Sc. médic. Vol. VIII. p. 328.—*Isenflamm* Anat. Untersuchungen, u. s. w. p. 37.—Several examples are given by *von Gothe* zur Naturwissenschaft, Vol. II. Part I. p. 7.—One example from *v. Gräfe's* Sammlung.—Dr. *Grossheim* in *v. Gräfe* and *v. Walther's* Journ. f. d. Chir. Vol. X. Part I. p. 152, pl. 3, fig. 4, and one example of a small bullet in Bresl. Mus. v. my Verzeichniss, No. 3296.

(62) *Combe* in Philos. Trans. 1811, Part I. p. 165.

§ 134.

The TONGUE-BONE, as being an appendage to the skull, must also be mentioned here. In monsters with deficient or very small tongues, this bone is sometimes completely wanting, or in the imperfect development of the neighbouring parts it exists only as a rudiment, and at the time of birth remains entirely cartilaginous. Sometimes in otherwise well-formed tongue-

bones certain parts are wanting, viz. once, one of the horns.[1] On the contrary, we also see the tongue-bone ossified too early;[2] in double monsters we find one made up of two tongue-bones consolidated together.[3] The size and form of this bone varies remarkably; in many cases we find it proportionally too small; in other cases very large and broad; the direction, curving, and length of the great horns, is not rarely unequal on the two sides,[4] the small horns also are unequal. The connexion of the several pieces is sometimes irregular, thus the large and small horns are anchylosed to the middle piece;[5] the fastening of the tongue-bone to the skull is sometimes found too firm.[6] We observe dislocations[7] and fractures[8] of this bone in consequence of external violence, as well also as greater or less destruction from caries,[9] as a primary and secondary affection.

(1) *Leveling* Anat. des Menschen, 1794, p. 167.
(2) *Loschge* Progr. de symmetria corp. human. Erlangen, 1793, p. 65.
(3) For example, my Selt. Beob. I. p. 14.
(4) *v. Soemmerring* Vom Baue des menschl. Körpers, 2d edit. Vol. I. p. 281. —Several instances are also found in Bresl. Mus.—In a few cases of stuttering persons, the tongue-bone was developed more on one side than the other.—*v. Serres* Anat. du Cerveau, Vol. II. chap. 4, p. 233.
(5) *Loschge*, already in a child a fortnight old.
(6) Inasmuch as the connecting ligament becomes more or less bony; I have some instances of its almost complete ossification before me; in a horse the tongue-bone was in one instance completely anchylosed with the styloid process.
(7) *Valsalva* De aure humana in Oper. Venet. Ausg. p. 35. — *Molinelli* in Comment. Bonon. Vol. V. Part I. p. 90; Part II. p. 1.—*Cederschjöld* in Ars-Berättelse om Svenska Läkare-Sällskapets Arbeten. Stockh. 1818.
(8) For instance, in persons who have been hanged.—*Cerutti*, No. 804.
(9) *Tode* Med. Journ. Vol. III. Part II. p. 43.—*Biermayer* Mus. anat. path. No. 545.

B.—OF THE BONES OF THE TRUNK.

§ 135.

The SPINE,[1] being the first and most important part of the skeleton, is entirely WANTING only in rare cases, and in the most imperfect monsters;[2] its formation is more commonly deficient only at certain parts; thus in the acephalous monsters, there is usually wanting, together with the head, more or less of the spine, according as the neck, breast, and even part of the belly are deficient in these monsters. Very generally we find in monsters with anencephaly, the vertebræ of the neck in part imperfectly formed, in part one or many of them wanting;[3] in

very rare cases also, of otherwise well-formed persons, we miss one of the cervical vertebræ.[4] In monsters with cleft and curvature of the spine,[5] although with bodies otherwise well formed, several of the dorsal and lumbar vertebræ are deficient;[6] sometimes the hinder extremity of the spine is imperfectly developed, so that it is either entirely or partially wanting, or the number of the sacral and coccygeal bones is diminished.[7] Very much more rare is the actual INCREASED NUMBER of the pieces of the spine; it is but trifling, however, as we never notice more than one superfluous vertebra; thus, we observe in very rare instances eight cervical vertebræ,[8] more commonly thirteen dorsal,[9] and six lumbar[10] vertebræ in man; sometimes also the sacrum[11] and the coccyx[12] have a vertebra too many. In very many instances we observe VICES OF SIZE AND FORM in the vertebræ; in monsters with anencephaly, hydrencephalocele, dropsy of the head, as well as with curvature and cleft of the spine, the vertebræ are sometimes very imperfectly formed, consolidated, but half, unusually narrow, &c.;[13] not unfrequently the spine is in them, as also in adults, remarkably short in proportion to the other parts of the body; there has been once observed, in an otherwise well-made child, one dorsal vertebra only half formed,[14] and on the lumbar vertebra of an adult, an articular process with half of the arch deficient;[15] in an adult cow the eleventh and twelfth dorsal vertebræ were partially double, each having two spinous processes;[16] the sixth cervical vertebra of a man was found spiral-shaped;[17] in rare cases there occur productions on the first vertebra, which are articulated with the occipital bone;[18] the form of the first vertebra is, however, besides, frequently very variable;[19] the lowest cervical vertebra has also a second hole in its transverse process for an accessory vertebral artery; the last dorsal vertebra assumes the form of a lumbar;[20] the spinous processes especially of the dorsal vertebræ, are frequently very much arched; on the lumbar vertebræ sometimes occur very long transverse processes,[21] also not uncommonly there are on them, in man, large *processus accessorii;* the sacrum exhibits very many varieties in reference to its length, breadth, and curvature, not unusually is its upper false vertebra, even in adults, completely separate from the following, either on one or both surfaces, or it assumes on one side more or less completely the form of a lumbar vertebra;[22] the vertebræ in the reproduced tails of lizards are never normally formed, and the processes are mostly deficient;[23] sometimes the form of the spinal canal is irregular,[24] and the size of the holes in the vertebræ varying. A malformation of the spine of man and animals, as common

as it is great, is the CLEFT SPINE, *spina bifida, hydrorrhachia,* or *hydrorrhachis,*[25] in which, as an original vice, on account of the collection of water in the spinal canal, at a very early period, the vertebræ are more or less cleft, and stayed in their development. In rare instances we see only a single little irregular opening on the hinder surface of the spine,[26] or more commonly the arched part of the vertebra is not closed, more or less open, pressed forwards, and entirely wanting, or in the highest degree even the bodies of the vertebræ are cleft;[27] sometimes also the transverse and articular processes, as well as part of the body of the vertebra, are deficient.[28] The cleaving of the spine usually occurs at one part of the column, and most commonly in the lumbar and dorsal regions, if it be not at the same time connected with anencephaly and hydrencephaly, with which commonly the cervical region is simultaneously cleft; it is least frequent in the neck. In many instances is the whole spine cleft and open from top to bottom,[29] it has also been seen cleft in two places at the same time;[30] and in one instance it still remained in an adult male.[31] But even without any dropsy in the spinal canal, we sometimes observe in the atlas and in the sacrum, that the hinder arched part has not closed, but that a gap is formed; indeed in an adult cretin, the spinous processes of all the dorsal vertebræ still remained thus cleft.[32] Some also have thought they found an imperfect union of the original bony pieces in other parts of the vertebræ.[33] The spine frequently presents as a congenital state,[34] but more commonly as the consequence of diseases and injurious practices,[35] irregular BENDINGS and CURVATURES, *spinæ dorsalis distortio, curvatura,*[36] of which there are given four principal kinds, viz. the posterior curvature, the HUMP-BACK, *gibbositas, kyphosis,*[37] the lateral curvature, *skoliosis seu obstipitas,*[38] the curvature forwards, or in animals, downwards, SINKING BACK, *lordosis,*[39] and lastly, the REVOLVING SPINE, *rotatio spinæ.*[40] In many instances several of these kinds occur in the same spine at once. In animals also curvatures of the spine are not infrequent.[41]

Concerning VICES OF CONNEXION of the spinal column, to these belong, DISLOCATIONS OF THE VERTEBRÆ,[42] which on account of the firm connexion of these bones with each other, is, proportionally, rarely produced by mechanical, more frequently from internal causes, especially between the first two vertebræ;[43] as also the opposite vice, viz. the TOO FIRM AND CONSTRAINED CONNEXION OF THE VERTEBRÆ, and the actual CONSOLIDATION OF THEIR JOINTS, *ankylosis.*[44] The latter vice is not rarely congenital,[45] especially in connexion with cleft

and curved spine, but it more frequently occurs at a subsequent period, particularly in the curvature of the back in old persons, and as a most fortunate occurrence after spondylarthrocacy and caries; in animals also, especially in such as often have the back much strained, as in horses and asses, anchylosis of the vertebræ is by no means rare.[46] The consolidation is produced sometimes by ossification of the joint ligaments, and sometimes by true soldering together of the articular surfaces, sometimes by irregular bony growths; it commonly affects only individual joints, or few vertebræ, more seldom almost the whole spine.[47] Fractures of the vertebræ,[48] on account of the simultaneous strength and suppleness of the spine, are proportionally rare, and mostly fatal at an earlier or later period; they are, however, in individual cases, cured by callus,[49] or the formation of a new joint.[50]

Finally, of the vices of texture which occur in the bones of the spine, we must especially mention, on account of its frequency and malignity, the scrofulous inflammation of the vertebræ, *spondylarthrocace*,[51] which very often gives rise to hump-back and to caries,[52] especially of the bodies of the vertebræ; this latter disease, as well as erosion of the vertebræ, which is not to be confounded with it, often arises from other causes, viz. mechanical influence on the sacrum from decubitus, often from scrofulous tumours running into suppuration, from melanosis, and from lymphatic swellings,[53] lumbar abscesses,[54] aneurysms,[55] &c.;[55*] in animals also caries is not rare.[56] Finally, inflammation of the spine and its periosteum give rise in many cases to spina ventosa, and to large exostoses.[57]

(1) *Franck* Oratio de vertebralis columnæ in morbis dignitate in Delect. Opuscul. Vol. IX. No. 1. Paviæ, 1791.—*van Gesscher* Ueber Entstellungen des Rückgrathes und Schenkelbeines, a. d. Holländ. 8vo. Götting. 1793. — *Guyenet* D. sur quelques maladies, qui affectent la colonne vertebrale. Montpell. 1809.— *Demussy* Histoire de quelques affections de la colonne vertebrale. 8vo. Paris, 1812. — *J. Gordon* D. de morbo vertebrarum. Edinb. 1813. — *Copeland*, Observations on the diseased Spine. 8vo. London, 1815.— *T. Sheldrake*, A treatise on diseased Spine and distorted Spine, with cases to illustrate the success of a new method of cure. London, 1816. — *Simpson*, C. de Spina dorsi vitiosa. Edinb. 1821.—*Lloyd*, A treatise on the nature and treatment of Scrofula, describing its connexion with the diseases of the Spine, Joints, Eyes, Glands, &c. London, 1821.—*Ch. Bell*, Observations on the Injuries of the Spine, and of the Thigh-bone, &c. London, 1824, with nine plates. — *Cunow* D. de morbis columnæ vertebralis. 8vo. Halæ, 1825. — *C. Wenzel* Ueber die Krankheiten am Rückgrathe. gr. fol. Bamberg, 1825, with eight engravings.—*Dugés* in Revue médicale francaise et étrangère. Vol. X. p. 353. — *Harrison* in *Fothergill's* medical and physic. Journ. Vol. XLV. Feb. and Pathological and Practical Observations on Spinal Diseases, illustrated with cases and engravings; also an Inquiry into the origin and cure of distorted limbs. 8vo. London, 1827, with fifteen plates.

(2) Compare above § 104, note 2. — In an acephalous monster, which merely consisted of pelvis and lower extremities, the sacral and coccygeal bones, together

with all trace of the spine, were deficient. v. *Bonn* in Verhand. van et Genootschap ter bevordering der Heelkunde. Amsterd. D. III. p. 124.—A similar case of its total deficiency in another acephalous monster. v. *Clark* in Phil. Transact. 1793, p. 154.

(3) *Haller* Opera minora. Vol. III. p. 14, v. the Vertebræ.—My Monstror. sex humanor. anat. et phys. disquisitio, Francof. ad V. p. 7, 13, 14, twice but four, once only three vertebræ; and Selt. Beob. Part I. No. 9, in a double monster from a sheep, in the neck but six vertebræ.—I have, however, since seen it in many anencephalous monsters.—In the Cabinet of Nat. Hist. at Stuttgart, I saw only two cervical vertebræ in one such monster.—Several instances of deficient individual vertebræ are given in *Meckel* Descriptio monstror. nonnullor, etc. p. 10, 19, 26. Lips. 1826.—*Rathke* in *Meckel* D. Archiv f. d. Phys. Vol. VII. p. 490, only six cervical vertebræ.—*Detharding* in Nov. Act. Phys. med. Vol. X. Part II. p. 706, merely the rudiment of an atlas and epistropheus; also in hydrencephalocele. v. *Burkart* D. de monstro humano notabili, Friburgi Brisg. 1825, p. 15, but five cervical vertebræ.

(4) *Columbus* De re anat. p. 263.—*Cullen*, Practice of Physic, Vol. III. § 1107, saw this in a family disposed to apoplexy, even hereditarily.—I have lately seen a case of this very kind in an adult man. v. No. 8852 of Bresl. Mus.

(5) *Malacarne* in Mém. della Soc. Ital. XII. p. 164. — *Meckel* Handb. d. pathol. Anat. Vol. I. p. 201.

(6) For instance, two skeletons, with eleven dorsal, but six lumbar vertebræ, in the Anat. Mus. at Kiel.—In oxen, only twelve dorsal vertebræ. v. *Pilger* Handb. der Veterinär-Wissensch. Vol. I. p. 502. — In the horse, but five lumbar vertebræ. v. *Pilger*, p. 494, note. — Allg. Hist. der Natur. Vol. II. Part II. p. 189. — *Rudolphi* Bemerk. auf einer Reise. Part I. p. 37.

(7) In a calf, most of the lumbar, and all the sacral, and coccygeal vertebræ were wanting, and the lower extremities were attached by ligament to the first lumbar vertebra. v. *Sandifort* Mus. anat. Vol. III. No. 1009, p. 294. — In another calf, No. 1060, *ib.* only the hind part of the sacrum, and all the coccygeal vertebræ; instead of the sacrum and coccyx, there has been seen merely a single small bony germ. v. *Friedlieb* Monstrosi fœtus descriptio atque delineatio. 4to. Altonæ, 1803, p. 33, tab. 4 and 6, on children, with congenital large encysted tumours on the back.—The evolution of the lower part of the spine is sometimes retarded. v. my Selt. Beob. Vol. II. p. 165.—In No. 2903, Bresl. Mus. the coccyx is wanting entirely.—The pelvis in man has rarely but four, and the coccyx frequently but three pieces.—Often in animal monsters, the whole tail is either deficient, or uncommonly short.—This is seen hereditary in the horse, dog, and the peculiar race of tailless fowls.—In domestic animals, however, the normal number of pieces in the tail varies; thus, in the horse, from thirteen to twenty-four; in oxen, from sixteen to eighteen; in sheep, from sixteen to twenty, &c.

(8) *Eustachius* Ossium examen, p. 210.—*Columbus*, p. 484.—*Palfyn* Anat. Vol. II. p. 100.—*Leveling* Observ. anat. rarior. Fasc. I. C. III. — *Ackermann* Ueber die körperliche Verschiedenheit des Mannes vom Weibe, p. 49, note k. v. *Meckel* De duplicitate monstrosa, p. 27. To a certain degree also belongs here the case quoted under note 16 below.

(9) *Morgagni* De sed. et caus. morb. L. I. Epist. V. note 6.—*Böhmer* Observat. anat. Fasc. I. præf. p. 5. — *Fabricius* Animadv. var. argumenti. Helmst. 1783, p. 9. — *van Doeveren* Spec. observ. acad, p. 201. — *Meckel*, p. 25 and 28. — One case in my Selt. Beob. I. p. 70; and Verzeichniss, No. 3312, in which there is a mistake, there not being six lumbar, but thirteen dorsal vertebræ.—In Anat. Mus. zu Kiel, there is also a skeleton, with thirteen dorsal vertebræ. — In animals, a dorsal vertebra too many.—In a horse at Hanover, there are nineteen dorsal vertebræ.—*Rudolphi*, I. p. 74.—In an ox. v. *Pilger*, p. 502.

(10) v. *Blumenbach* Geschichte und Beschreib. d. Knochen, 2d. edit. p. 309.—*Hesselbach* Beschreib. d. pathol. Präparate zu Würzburg, No. 651, p. 12. — In two sheep, a supernumerary lumbar vertebra. v. *Rudolphi*, I. p. 37.

(11) *van Doeveren*, p. 206. — *Albinus* Annot. acad. lib. IV. C. XI. de osse sacro. — *Sandifort* Mus. anat. Vol. I. p. 87, No. 352; p. 176, No. 162 and

177; No. 163; compare *Blumenbach*, p. 316.—Some instances also in Bresl. Mus.

(12) As it appears more frequently in women. v. *von Sommerring*, Vom Baue des menschl. Körpers. 2d edit. I. p. 360. — I have also some instances before me. If the observations about men with tails are to be believed, the coccygeal vertebræ must have been much increased or very long.

(13) I have seen this in a great number of monsters, especially in the Anencephalous. v. D. Monstror. sex humanor. anat. et phys. disquisitio; Selt. Beob. I. p. 20, and since in several more.—*Meckel* Handb. der pathol. Anatomie, Vol. I. p. 382, and Descript. monstror. nonnullor, p. 10, 19, 26, 36.—*Seerig* D. de hydroencephaloceles specimine eximio, p. 12. 4to. Vratisl. 1822.

(14) On No. 3018 in Bresl. Mus. v. my Selt. Beob. II. p. 15.

(15) *Rosenmüller* D. de singularibus et nativis ossium c. h varietatibus, p. 58.

(16) I saw this in the Veterinary School at Munich, the cow had supernumerary feet on this part, and, according to the account, she had also an udder here; the lumbar vertebræ exhibited a spina bifida; the spinous processes of the dorsal vertebræ were not at all cleft, but actually double.

(17) It formed two turns with two spinous processes, and on each side two transverse processes. I saw this very remarkable piece in the Anat. Mus. of the Joseph Academy, at Vienna.

(18) *Leveling* Observat. anat. rar. p. 134, tab. 5, fig. 1.—*Sandifort* Mus. anat. Vol. II. tab. 14, fig. 3, v. § 125, note 7.

(19) Compare *v. Sömmerring*, p. 312, § 284.—I have frequently found it, as it were, squeezed flat, in water of the head, and rickets.—A similar atlas is described by *Kelch* Beiträge zur pathol. Anatomie, No. VIII.

(20) Only on one side in an ass. v. Allgem. Historie der Natur. Vol. II. Part II. p. 219.

(21) I have seen this several times;—in many cases they are so large on the fifth lumbar vertebra, that the vertebra is locked between the hip bones, and indeed resembles the first false vertebra of the sacrum. v. *Kelch*, No. X.—On the first lumbar vertebra of two horses, in the Veterinary School, at Stockholm, I saw the transverse processes almost as long as the last rib, formed also like it, with a cartilage at the extremity, not however movable.

(22) This seems to occur only in men.

(23) I have this in No. 8160 of Bresl. Mus. before me.—In the Anat. Mus. at Prague, I also saw the skeleton of a lizard, which had lived for three years after breaking off the tail, without the new vertebræ becoming ossified, or having processes.

(24) To wit, too narrow or too wide, compressed, completed at an early period, so that there is no hole in the sacrum.—I have seen the latter in children with cleft spine. — *Stoll* Ratio medendi. — *Mohrenheim's* Beobactungen, u.s.w. Vol. I. p. 174.

(25) *Reuss* Repertor. Comment. Vol. XIII. p. 570.—*de Plouquet* Repertor. Art. Hydrops spinæ.—*Hochstetter* D. de Spina bifida. Altdorf. 1703. — *Titsingh* Heelkundige Verhandeling over de tegen-natuurlyke Splytinge de Rugge-graat. 8vo. Amsterd. 1782, with four engravings. — *Vyllhoorn* Noodig Denkbeeld van Spin. bif. 8vo. Amsterd. 1732, with an engraving; and Tweede Vertoog over het ongemak van de Spin. bif. u. s. w. Amsterd. 1733. — *Platner* Progr. de Sp. bif. Lips. 1734.—*Gild* D. de Sp. bif. Viennæ, 1754. v. *Haller's* Diss. pract. VII. note 253. — *Murray* D. Sp. bif. ex mala ossium conformatione initia. Goetting. 1779. v. Opusc. II. note 5.—*Cappel* D. de Sp. bif. Helmst. 1793.—*Meckel* D. de hydrorrhachia. Halæ, 1795. — *Bauer* D. de hydrorrhachitide. Erford. 1798. — *Bodin* D. de Sp. bif. v. Journ. de Médec. continué. Vol. III. p. 148.—*Fleischmann* De vitiis congenitis circa thoracem et abdomen, p. 9. Erlangæ, 1810.—*J. F. Meckel* Handb. der Pathol. Anat. Vol. I. p. 356. — *Forster* D. de Sp. bif. 8vo. Berol. 1820. — *A. F. Moeckel* Comm. de Hydrorrhachitide. 8vo. Lips, 1822, with engravings.—Compare No. 3313—3319.

(26) *Ruysch* Observ. anat. chir. Obs. 36.—*Acrell* in Schwed. Abhandlung. Vol. X. p. 291.

(27) *Tulpius* Observ. med. p. 230.—*Wepfer* in Ephem. Nat. Cur. Dec. I. Ann.

III. Obs. 129, p. 222.—*Bugden* in Philos. Transact. Vol. XXXVI. No. 410.—*Salzmann* in *Orthii* D. de quibusdam tumor. tunicat. ext. recus. in *Haller's* Coll. Diss. med. chir. Vol. V. § 3, p. 411.—*Camerarius*, *ib.* § 4.—*Fleischmann.*—*Lallemand* Observat. patholog. p. 32. Paris, 1818. —*Meckel* Anat. phys. Beobacht. und Untersuchungen. p. 90, 96. —*v. Loder* Index præparator. Abschn. Part II. No. 3313 of Bresl. Mus. seem to belong here; also No. 3318.

(28) In a calf, I saw the cleft entirely on the right side of the spine, so that the right half of the vertebræ was entirely wanting, while the left half, both of the bodies and arches, were perfect. v. my Verzeichniss, No. 3318.

(29) Several examples in Bresl. Mus. v. *Fielitz* in *Richter's* Chir. Biblioth. Vol. IX. p. 185. —*Hoin* in Mémoir de Dijon, Vol. II. p. 105. —*Bidloo* Opera omnia. L. B. 1715, pl. 4, fig. 1 and 2, from the first vertebra even into the sacrum.—*Palletta* Exercit. pathol. I. fig. 11.—*Potthof* D. Descriptio casus rarissimi spinæ bifidæ totalis. Berol. 1828.

(30) *Camper* Ueber die Natur und Ursachen der versch. Wassersuchten. v. Samml. auserl. Abhandl. f. prakt. Aerzte. Vol. X. p. 448.

(31) *J. P. Frank* Delectus opusculor. medicor. Vol. II. p. 33, in the note.—Perhaps here belongs, as a less degree, the case engraved by *Sandifort* Mus. Anat. Vol. II. tab. 45, fig. 1—3, in which the cavity of the sacrum of an adult man was, at one spot, remarkably enlarged, and its sides expanded.

(32) *Prochaska* Disquis. anat. phys. organ. c. h. tab. 9, fig. 2.

(33) *Bichat* Anatomie descriptive, Vol. I. p. 133; the arch of a lumbar vertebra movably connected with its body, was seen by *Heiland*, in Ephem. Nat. Cur. Dec. III. Ann. VII. p. 278, and *Rosenmüller*, p. 57;—a transverse process joined to its vertebra.—*Ungebauer* Epistola osteologica de ossium trunci genesi, p. 257, Lips. 1739, and twice in *Rosenmüller*, p. 58. —A movable spinous process on the sacrum, in *Hebenstreit* de rarior. quibusdam ossium momentis, p. 7. Lips. 1740.—On the point of the spinous process of the seventh cervical vertebra, there was a roundish bone articulated, almost as large as a hazel nut, v. *Kelch*, No. 9; and a similar bone on one lumbar vertebra. v. *Schulze* in Commercio Noric. 1731, No. V. p. 33. Perhaps, in both cases, there were sessamoid bones. Compare below, note 48.

(34) For instance, in monsters with anencephaly, and hydrencephaly, very often in the neck; in man and animals with cleft spine, with lateral excentration: in many double monsters, very common in calves, &c.

(35) Especially in softening of bone, erosion, inflammation, and ulceration of the vertebræ, and the intervertebral substance, from muscular weakness, negligent carriage, and various mechanical causes, as tight lacing.

(36) Compare above, note 1. — *Jones*, Essay on Crookedness or distortions of the Spine. 8vo. Lond. 1788. —*Palletta* Beobachtungen über die mit Lähmung verbundene Krümmung des Rückgraths, a. d. Ital. 8vo. Tubing. 1795. —*Portal* Observations sur la nature et le traitement du Rhachitisme, ou des courbures de la colonne vertebrale et de celles des extremités. 8vo. Paris, 1798. —*Wilkinson*, Physiol. and philosophical Essays on the distortions of the Spine. 8vo. Lond. 1798.—*Earle*, Observations on the cure of curved Spine, &c. 8vo. Lond. 1803.—*Frolich* resp. *Meyer* D. de curvatura spinæ dorsi cum paralysi extremitatum inferiorum. 4to. Upsal. 1804. —*Feiler* De spinæ dorsi incurvationibus, etc. 8vo. Norimb. 1807, with figures.—*Jörg* Ueber die Verkrümmungen des menschlichen Körpers und die Heilart derselben. 4to. Leipz. 1816, with engravings. —*Macartney*, Observations on the Curvatures of the Spine. 4to. Dublin, 1817.—*Penneld* D. de spina incurva. Edinb. 1818. —*Malsch* D. de nova machina Græfiana, etc. nec non disquisitio deformitatum istarum. 4to. Berol. 1818.—*Choulant* Decas pelvium spinarumque deformatarum. 4to. Lips. 1818. —Decas secund. Lips. 1820. —*Hasbach* D. de distortionibus columnæ vertebralis in genere. 8vo. Marburg. 1820.—*Ward*, Practical Observations on Distortions of the Spine, Chest, and Limbs, &c. 8vo. London, 1822.—*J. Shaw*, On the Nature and Treatment of the Distortions to which the Spine and the Bones of the Chest are subject, &c. 8vo. London, 1823, illustrated by plates in folio; and further, Observations on the lateral or serpentine Curvature of the Spine, &c. 8vo. London, 1825. —*Dods*, Pathological Observations on the rotated or contorted

Spine, commonly called lateral Curvature, &c. 8vo. London, 1824.—*Jarrold*, An inquiry into the causes of the Curvatures of the Spine, &c. 8vo. London, 1824, with engravings. — *Strauss* D. de Spinæ vertebralis curvaturis cum statu paralytico junctis. 8vo. Marburg. 1824. — *Bampfield*, An Essay on Curvatures and diseases of the Spine, including all the forms of spinal distortions, &c. 8vo. London, 1824. 2d edit. 1826. — *Maisonable* Récueil d'observations sur les difformités dont le corps humain est susceptible, etc. Paris, 1825.—Good plates in *Walter's* Museum anatomicum. — *Sandifort* Mus. anat. Vol. II. tab. 36, 37, 41—43, 50—61, and *Wenzel.*—Many beautiful examples in Bresl. Mus. No. 3017—3025, 3329—3348.

(37) Gibber, Gibbus, Cyrtoma, &c.—*Reuss* Repertor. Comm. Vol. XIII. p. 383. — *de Plouquet* Repertor. Art. Gibbus, etc.– *Wedel* D. de gibbere. Jenæ, 1684. — *Crell* Pr. sectio puellæ gibbosæ. Helmst. 1745; and in Act. Acad. Nat. Cur. Vol. IX. p. 229. — *de Haller* Pr. Gibbi descriptio. Goett. 1749.— *Coopmann* D. de Cyphosi. Franequer. 1770. — *Donner* D. de gibbositate. Goett. 1785.

(38) *a Roy* Com. de Scoliosi. 4to. L. B. 1774. — *Reynders* D. de scoliosi ejusque causis et sanatione observatione et propriis experimentis confirmata. Groening. 1787. — *Pape* D. de Scoliosi ejusque casu rariore. 4to. Regiomont. 1808.—Here also belongs wry-neck, which, if it occur in early youth, often produces consequent obliquity of the vertebræ.

(39) *G. W. Wedel* De Lordosi in Misc. Acad. Nat. Cur. Dec. II. Ann. V. p. 445.

(40) This kind rarely occurs as a congenital disposition in man, and only in a minor degree.—More frequently in animals, especially in calves, and is then sometimes so great, that the spine can be twisted round once or twice on its axis.—I have seen this several times, v. my Verzeichniss, No. 3034.—*Blumenthal* D. de monstroso vituli sceleto. 8vo. Regiom. 1826, with lithographic tables.

(41) Much more rarely however than in man; and this, besides other causes, on account of the horizontal position of the spine.—On distortions in animals, v. *Camper* Von den Krankheiten, die sowohl den Menschen als Thieren eigin sind. p. 28. 2d edit.—It has been found in monkeys, dogs, &c. v. *Voigtel* Handb. der pathol. Anat. B. I. p. 316; in the hare, pig, horse, and ass, especially the sinking back; although also other kinds, for instance, great lateral curving. — *Rudolphi* Bemerkungen, u.s.w. Vol. I. p. 74. — A humpback, v. *Neergaard* Beiträge zur vergl. Anatomie, u.s.w. p. 37, tab. 1. Gött. 1807.—In oxen, v. my Verzeichniss, No. 3032, 3034, 3317, 3318.—In lambs, of which I have several examples, v. No. 3323 and 3324.—In birds, viz. fowls and geese; of the latter, there are two instances in Bresl. Mus. — Examples in Bresl. Mus. No. 3038 and 3039. — Even in fishes, v. *Camper.* — *Bergmann* Primæ lineæ pathologiæ comparatæ, p. 30, (in Perca fluviatilis).— *Bleuland* Descriptio Musei anat. No. 2569, p. 407, (in Pleuronnectes Flesus).—*G. Sandifort* Mus. anat. Vol. III. p. 276, No. 916 and 917.

(42) v. *Reuss* Repertorium. Comment. Vol. XIV. p. 113.—*de Plouquet* Art. Vertebrarum Luxatio.—*Columbus*, *Valsalva*, *Morgagni*, *Heister*, *Mauchart*, *Tabarranus*, *Palletta*, *Schack*, *Cooper*, &c. maintain that dislocation from external causes can never occur without simultaneous fracture; others properly admit them, at least subluxations; viz. *Rust* in Arthrokakologie, and *Boyer*, (between the atlas and epistropheus.)—*Ch. Bell* describes and engraves several dislocations; a dislocation of the fifth cervical vertebra is described by *Thillaye* in *Leroux* Journ. de Médec. 1816, p. 35. Bulletin de la Faculté, p. 26.—Of the seventh cervical by *Gaitskell* in the London medical Repository, April, 1821, Vol. XV. p. 282.—Edinburgh Med. and Surg. Journ. July, 1819.—Of the fourth cervical, by *Lawrence* in the Lancet, Vol. XI. p. 749.—v. *Deggeller* Diss. de luxatione vertebrarum. Altdorf. 1707.—*Mauchart* Pr. de luxatione nuchæ. Tubing. 1747. *Cuenotte* D. s. casum subluxationis vertebræ dorsi cum fractura complicatæ, etc. 8vo. Argentor, 1761.—*Murray* D. de spinæ dorsi luxationibus. Upsal. 1780.— *Ludwig* De luxatione vertebrarum colli a medico forensi circumspecte disquirenda. Lips. 1787.—*Sömmerring* Bemerkungen über Verrenkung und Bruch des Ruckgraths. 8vo. Berlin, 1793.—A good collection of cases are given by

Casper in *Rust's* Magazin f. d. gesammte Heilk, Vol. XIV. p. 433.—Several also are found in *v. Gräfe* and *v. Walther's* Journ. f. Chir. Vol. III. Part II. p. 197.—*J. F. L. Rauch* D. de vertebrarum cervicalium luxatione. 8vo. Berol. 1828, (of the fifth and sixth.)—[Dislocation between the last dorsal and first lumbar vertebra. v. Med. Gazette, Vol. III. p. 651. — Dislocations of the vertebræ from each other without fracture, are, as far as I am aware, extremely uncommon. T.] Imperfect dislocations in the horse, of which *Havemann* has spoken, are observed by *Lebel.*—v. Recueil de Médec. veterinaire. Vol. II. Sept. 1825.

(43) Especially from inflammatory swelling of the vertebræ, caries, destruction of the ligaments, exostosis, &c. it is most common on the first two vertebræ; it has been also observed by *Daubenton* v. Allg. Historie der Natur. Vol. II. Part I. p. 68, No. 200.—*Duverney* Maladies des Os. II. p. 131.—*Sandifort* Mus. anat. Vol. I. p. 143; Vol. II. tab. 14 and 15; Vol. III. p. 384, No. 603.—*Rust's* Magazin f. d. gesammte Heilk. Vol. XII. Part II. p. 413.—*Bauer* in Tübinger Blättern, Vol. I. No. 2, p. 154.—*Schupke* De luxatione spontanea atlantis et epistrophei. 4to. Berol. 1816, with one engraving.—*Schrag* D. de luxatione vertebrarum spontanea. 4to. Lips. 1817.—*de Wagner* D. de luxatione capitis spontanea. 8vo. Dorpati, 1822, with engravings.—*Shaw.*—*Rosenthal* Abhandl. aus dem Gebiete der Anat. Physiol. und Pathologie. 8vo. Berlin, 1824, p. 141, pl. 9.—*J. Cloquet* in Archives générales de Médec. Jan. 1824, p. 143.—I myself have seen this three times; v. Selt. Beob. I. p. 80, and Verzeichniss, No. 3361—3363.—*Bertin* Traité d'osteologie, Vol. III. p. 61.—*Ollivier* Traité de la moelle epinière et de ses maladies, &c. 2 vols. 8vo. 2d edit. Paris, 1827.—*C. A. Parry.*

(44) Compare above § 109, note 7.—*de Plouquet* Repertor Vertebrar. Ancylosis, and *Voigtel* Handb. der pathol. Anat. p. 227, ff.—It frequently occurs on all the vertebral regions, viz. between the atlas and occipital bone, between that and the second vertebra, or between all three; hereto belong almost all the cases mentioned in the last note; further, *Götz* Diss. de morbor. ligamentor. Halæ, 1798, p. 32.—*Kelch* No. 8.—I have twice found it, viz. No. 3360; I saw several instances in the Mus. of *Brookes* at London; in *Sandifort's* at Leyden; two cases in the Mus. pathologicum at Vienna; three cases in the Anatom. Museum at Heidelberg; an anchylosis of the second vertebra with the occipital bone in destruction of the front arch of the atlas was seen by *J. Cloquet.*—In a horse, *Viborg* in Veterinair-Selsk Skrifter. Vol. III. p. 479, &c.—Anchylosis of several or all the cervical vertebræ, v. *Bacheracht* D. sur le Scorbut, § 40.—*Albrecht* in Act. phys. med. Vol. VIII. Obs. 124, p. 452.—My Verzeichniss, No. 3363, and a similar case in *Brookes's* Mus.—Sometimes the cervical vertebræ are anchylosed also in very early existing collum obstipum.—Anchylosis of the dorsal and lumbar portions of the spine are very common; also the consolidation of the sacrum with the last lumbar vertebra, and with the coccyx; so also are anchyloses of the false vertebræ not rare. v. *Sandifort* Mus. anat. Vol. II. pl. 38—44, and my Verzeichniss, No. 3365—3373.

(45) I have found this in several human monsters, also in calves and sheep. v. Verzeichniss, No. 3032, 3034, 3324, 8016.—In a calf, *G. Sandifort* Mus. anat. Vol. III. p. 294, No. 1009, 1010.—In a monstrous stag, *G. Jäger* in *Meckel's* Archiv f. Anat. und Physiol. 1826, No. 1. p. 65 and 66.

(46) On anchylosis of the vertebræ in the horse, v. *Albrecht* in Nov. Actis Acad. N. C. Vol. VIII. p. 452.—Complete anchylosis of all the dorsal and lumbar vertebræ in two horses was found by *Greve* Erfahr. und Beobachtungen über die Krankheiten der Hausthiere, Vol. II. p. 3.—Instances of anchylosis in horses, v. *Sandifort* Vol. III. p. 243, No. 689—701.—My Verzeichniss, No. 3374—3381.—In an ass, *Pilger* Handbuch der Veter. Wiss. Vol. II. p. 1824.—Allg. Historie der Natur. Vol. II. Part II. p. 223, No. 436.—In a sheep, of which I saw an example at Alfort.—In a boa constrictor.—*Sandifort*, p. 243, No. 703.

(47) Compare § 109, note. 11.—*G. Sandifort* Mus. anat. Vol. III. p. 236, No. 639.—An anchylosis of all the vertebræ, but only on the right side, after rheumatism, was seen by *J. Cloquet*, v. Archives générales de Médec. April, 1823. [*R. Connor*, in Phil. Trans. Vol. XIX. p. 21, gives an account of a spine, "the ligaments of which were so perfectly bony, and their articulations so

effaced, that they really made but one uniform continuous bone. On sawing through them it was found that the ossification extended two lines deep, and the rest of the surfaces of the bodies were ununited as usual." There is in the Mus. Roy. Coll. Surg. No. 310, one example; and in the Mus. at St. Thomas's Hospital, another of anchylosis of the first vertebra with the occipital bone; and in the latter collection another of the first and second cervical vertebræ, both of which are, I believe, extremely rare. T.]

(48) *Ludwig* Pr. de Paraplegia e fractura vertebrarum colli. Lipsiæ, 1767.—*v. Sömmerring* Bemerkungen über Verrenkung und Bruch des Rückgraths. Berlin, 1793.—*Haugk* D. de fractura sterni et vertebrarum. 4to. Lips. 1816.—*Casper* in *Rust's* Magazin f. d. ges. Heilk. Vol. XIV. p. 433.—*A. Cooper* Lectures by *Tyrrel*, Vol. II. p. 6. [Among the cases related in which, is a most remarkable one of transverse fracture of the atlas, without displacement, which occurred to Mr. Cline, sen. in which, when the head was depressed or elevated, the atlas was displaced from the epistrophea, the dentiform process of which, together with the broken piece of the atlas connected with it, was then thrust against the spinal marrow; the child lived twelve months after the accident. T.]

(49) Ephem. Nat. Cur. Dec. II. Ann. VI. Obs. 142; and *ib.* Cent. I. Obs. 1; *van de Wynpersse* D. de Ancylosi, p. 21, tab. 1, fig. 4.—*Sandifort* Mus. anat. Vol. II. tab. 40. fig. 6 and 7, (after a gun-shot, the bullet grew in,) and Vol. III. p. 201, No. 340.—[In Mus. Roy. Coll. Surg. there is a very fine instance of a ball lodged in the vertebral canal; it rests in the front of the arch of the eleventh dorsal on the right side, and has become slightly embedded; its surface is rough, as if corroded. v. further for this in the Spinal Marrow. T.]—One case of united fracture of the spine I saw in Museum of *Brookes*, and in Hunterian Museum at London. [The preparation here alluded to, is a beautiful example of united fracture of the twelfth dorsal vertebra through the body and arch, in consequence of the man having been bent double by the falling in of a gravel pit. There is not very much displacement, and a broad band of bony deposit passes across the injured vertebra, connecting it with the lower edge of the superjacent vertebra on the left, and with the subjacent one on the right side, to which it is more firmly connected than to the upper. The man lived for twelve months after the accident. There is a specimen at St. Thomas's, in which there is a ligamentous union in one of the common cases, in which the fractured upper edge of the body of the lower vertebra had been carried forward with the displaced upper vertebra. T.]—Two instances are mentioned by *Richerand* Nosographie chirurgicale, and a case by *J. Cloquet* in *von Froriep's* Notizen. Octob. 1826, No. 322, p. 221.—A case of united fracture of the sacrum is engraved in *Sandifort*, Vol. II. tab. 45, fig. 5—7.

(50) Compare my Selt. Beob. II. p. 15, No. 7, and Verzeichniss, No. 6, 3321, and 3322, all three cases on the lumbar vertebræ; the arches were articulated on the bodies.—*Howship*, Practical Observations in Surgery and morbid Anatomy. Lond. 1816, 101st case.—*Shaw*, On the Nature and Treatment of Distortions, also relates one instance. The cases related above, at note 33, by *Heiland*, *Rosenmüller*, *Ungebauer*, and *Hebenstreit* belong, in my opinion, here, and not to vices of formation.—*Lisfranc* in Journ. gén. de Médec. Vol. XCVIII. March, 1827.—*Jefferys* in Lond. Med. and. Phys. Journ. July, 1826.

(51) Here belongs also the so-called *Morbus Pottii*, in which, at the same time, swelling of some vertebræ, distortion, and mostly lameness of the lower extremities, are connected with inflammation; the spondylarthrocacy especially affects the bodies of the vertebræ, particularly in the cervical and dorsal portions of the spine. Compare, on this disease especially, *Pott*, Remarks on that kind of palsy of the lower limbs which is frequently found to accompany a curvature of the spine, in Chir. Works, Vol. III. p. 349. Lond. 1779.—*Palletta* Anatom. pathol. Beobachtungen über die mit Lähmung verbundene Krümmung des Rückgraths. Tübin. 1794.—*Rust* Arthrokakologie, u. s. w.—*Schröder* D. de Spondylarthrocace. 8vo. Halæ, 1827.—I saw a case of morbus pottii in an old man. v. Selt. Beob. II. p. 17, and Verzeichniss, No. 3363.

(52) *Hunauld* D. an ab ictu, lapsu, nisuque quandoque vertebrarum caries. Paris, 1742.—*Balk* jun. Beobachtung über Beinfrass der Rückenwirbel in *Mur-*

sinnas Journal. Vol. I. p. 49.—*Joffrion* D. sur la carie des vertébres et les abcès par congestion, qui en sont frequemment un effet. 8vo. Paris, 1801.—*Fievet* D. sur la carie de la colonne vertébrale. Strasb. 1802.—*Ducasse* D. sur la carie du corps des vertébres. Paris, 1807.—*Blackburn* D. de spinæ carie. Edinb. 1822.—Caries on the first two vertebræ after spondylarthrocacy is not rare; instances are given in *Reil* Fieberlehre, Vol. II. § 102.—*Rust* in the Salzb. med. chir. Zeitung. 1813, Vol. III. p. 108; and in his Magaz. f. d. ges. Heilk. Vol. I. Part II. p. 213; and an engraving of it in the Arthrokakologie, pl. 5 and 6.—*Biermayer* Museum anat. pathol. No. 227 and 382.—*Raimann* in Medic. Jahrb. der östreich. Monarchie. Vol. III. No. 1, p. 43.—*Schallgruber* in der Wiener Literatur-Zeit. 1813, Part III.—*Schupke*, with engravings.—Carious destruction of the first two cervical vertebræ from venereal ulceration of the spine, so that the spinal marrow, with its membranes, was exposed from the mouth. v. Tübinger Blätter, Vol. II. Part II. p. 135.—Carious exfoliation of the greater part of the body of the second cervical vertebra cured, was seen by *J. Syme*, v. Edinb. med. and surg. Journ. April, 1826.—Caries of the sacrum, *Biermayer* No. 107, 234, and 544.—*Sandifort*, Vol. II. tab. 44, fig. 4.—My Verzeichniss, No. 3406, 3408.—Caries and erosion of the sacrum consequent on concubitus analis, v. my Verzeichniss, No. 3404.—*Ib.* No. 3351—3358 several instances of caries on the vertebral column.—[An instance of syphylitic caries of the dentiform process of the second vertebra occurred several years since in St. Thomas's Hospital, which so much destroyed it that the mere weight of the head broke it, and the woman was killed by pressure upon the spinal cord. T.]

(53) On the transverse processes of the four lower cervical vertebræ.—*Palletta* Exercit. pathol. Vol. I. p. 62.—On the lumbar vertebræ *Biermayer*, No. 370.—I have described several instances of this kind in my Selt. Beob. Part II. No. 33.—A case of caries in consequence of scrofulous suppuration of the throat, v. my Verzeichniss, No. 3352.

(54) *Knackstedt* Medic. chir. Beob. No. 54.—*Selle* N. Beiträge II. p. 102.—*Howship*, 100 and 101st cases.—Several instances in the Strasburgh Museum. Compare *Kilian* Anat. Untersuchungen über das 9th Hirnnervenpaar, p. 121.—A psoas abscess connected with the vertebral canal. v. *J. Jackson* in New-England Journ. of Med. and Surg. Vol. V. No. 1, Jan. 1816.—Two psoas abscesses connected with each other through the spine, observed by *Milroy*, communicated by *Lizars* in Edinb. Medical and Surg. Journ. July, 1825.—In such lumbar abscesses, with caries of the spine, ascarides in very rare cases have been found; v. my Selt. Beob. II. p. 41, and *Velpeau* in Archives gén. de Médecine, Vol. VII. March.—*Sandifort*, Vol. III. p. 262, No. 839—844.

(55) The destruction of the vertebræ seems to take place, as *Scarpa* has very admirably shewn, usually from increased absorption, although in rare cases, if the morbid irritation produce inflammation in the bones; also from caries, of which I have an instance. *Scarpa* himself describes such cases; v. his Sull'Aneurisma reflessioni ed osservazioni anatomico chirurgiche. fol. Pav. 1804, translated by *Wishart*, 8vo. Edinb. 1808.—*Ayrer* Ueber Pulsadergeschwülste, u. s. w. Göttingen, 1800, p. 16.—*Eck* De carie articulorum externa. 8vo. Berol, 1818, p. 47.—*Cerutti* Beschreibung der pathol. Präparate zu Leipzig, No. 743, &c.

(55*) [In the Mus. at St. Thomas's Hospital, there are two fine instances of cancerous affection of the spine, which were concomitant with cancer of the breast. In one instance, the cellular structure of the bodies of the vertebræ is so completely destroyed, that they have been crushed by their own weight. In the other, there are distinct scirrhous tubercles, and the disease does not seem to have proceeded so far as in the former case. T.]

(56) For instance, in oxen and horses on the first cervical vertebra from poll-evil; v. my Verzeichniss, No. 3351. I saw similar instances on the atlas of two horses in the Veterinary College, London, and at Stockholm.—On the spinous processes of the withers of horses, from neglected saddle-gall, on the caudal vertebræ from tail-evil, of which I have seen instances in the veterinary schools at Berlin, Vienna, and Alfort, and not unfrequently on the tip of the tail in monkeys, makis, coatimondis, marsupial animals, &c. in confinement.

(57) I saw, in the Collection of the Joseph Academy at Vienna, a remarkable fungous exostosis of the spine, in consequence of a blow, projecting into the chest; a lesser one on the lumbar vertebræ, (called osteosteatoma,) is found in *Sandifort* Mus. Anat. Vol. I. p. 188; Vol. II. tab. 59 and 60.—I have a smaller one on the last lumbar vertebra. v. Verzeichniss, No. 3386.—A bony growth on the neck of a dog. v. *Viborg* in Veterinair-Selsk. Skrifter. Vol. III. p. 493.—Spina ventosa on the lumbar vertebræ of a pig, at Alfort.—Spina ventosa and exostosis are frequent on the tip of the tail in long-tailed monkeys, marsupial animals, coatis, &c.—I found a spina ventosa on some caudal vertebræ of a camelion; v. Verzeichniss, No. 4859.—Also large exostoses on some spinous processes in Lepidopus Peronii and Sparus erythrinus, v. No. 4899 and 4905.—An exostosis as large as a hen's egg on the spine of Gadus Æglefinus at Kiel. v. *Seidel* Index Musei anat. Kiliens. p. 28, No. 21.—A large exostosis on the side of the tail of a fish, v. *Sandifort*, Vol. III. p. 243, No. 702; and on two vertebræ of a boa constrictor, No. 703.

§ 136.

The RIBS exhibit many variations in reference to their usual NUMBER;[1] thus they are WANTING, for instance, in human and animal monsters with imperfect development of the upper half of the body, with deficient skull, with cleft breast and spine, congenital curvings, &c. usually also at the same time with deficient, imperfect, and consolidated dorsal vertebræ, or of themselves several ribs are alone absent;[2] the absence of one or other ribs, however, occurs also in otherwise well-formed men and animals, without absence of one vertebra.[3] On the contrary, we find also on one or both sides, ONE RIB TOO MANY,[4] and sometimes indeed when there is a dorsal vertebra too many, or the first lumbar supports a rib;[5] sometimes, in rare cases, from the seventh cervical vertebra springs a rib, either terminating loosely or connected with the breast-bone, or with the first normal rib.[6]

The SIZE and FORM of the ribs also deviate in various ways; we find them, either as a congenital or acquired state, irregularly SHORT,[7] of DIFFERENT LENGTHS[8] on the two sides; next, as it were, the commencement of duplicity, unusually THICK,[9] BROAD,[10] and MORE OR LESS DIVIDED at their front ends;[11] lastly, frequently ARCHED in a greater or less degree.[12] If the dislocated head of the upper arm-bone remain long upon the ribs, then a PIT is formed upon them. We also sometimes observe irregularities with respect to CONNEXION; thus on account of cleft spine, we observe the heads of the ribs lying in front of the bodies of the vertebræ, and touching those of the opposite side;[13] frequently is the attachment of the front ends of the true ribs deficient, inasmuch as, they are either not connected with their cartilages, or they are not connected by them to the breast-bone, or the cartilages are entirely deficient;[14] the first rib is even connected by a true capsular joint with its cartilage;[15] two ribs have, in rare cases, but one com-

mon cartilage;[16] sometimes instead of seven, only six, or even eight ribs are joined to the breast-bone;[17] we have also seen in one disease the costal cartilages separated from the ribs,[18] and in one instance, a costal cartilage DISLOCATED.[19] The ribs are not unfrequently anchylosed at their hinder ends, partly with the vertebræ,[20] partly irregularly connected with each other, in so far as that, as an original or acquired formation, they have as it were been consolidated,[21] or by particular processes,[22] or wing-like projections from their edges, jointed with the neighbouring ribs, or grown together.[23]

VICES OF CONSISTENCE in the ribs are also to be mentioned here; we find not merely in rickets, but also often in epilepsy, and idiots, that they are very soft, and bending like fish-bones.[24] The opposite vices are also found, that is, the too great brittleness and frangibility of the ribs, especially in long-continued disease of the lungs, in cancer of the breast, &c.; in which the cartilages of the ribs frequently participate, as, on account of the increased deposit of lime, they lose their elasticity and flexibility, sometimes on their interior, but more frequently on their external surface.[25] In consequence of this brittleness of the ribs, their otherwise great disposition to FRACTURE[26] is very much increased, which, if the motion of the broken parts be not entirely prevented, easily unite out of shape, or with UNNATURAL JOINTS;[27] the latter has many times been found congenital.[28]

Of the VICES OF TEXTURE of the ribs, we must here notice their frequent EROSION and DESTRUCTION by aneurysms in the cavity of the chest,[29] from CARIES in consequence of carsinoma of the chest, from consumption[30] and empyema; and lastly, EXOSTOSES,[31] which are observed in rare instances on the ribs.

(1) *F. J. Hunauld* in Mém. de Paris, 1740, p. 377,—*v. Sömmerring* Vom Baue des menschl. Körpers. 2d edit. Vol. I. p. 339, § 334. Variations of the ribs.

(2) In anencephalous monsters the upper vertebræ which exist do not support any rib; in many children with anencephaly, hydrencephaly, spina bifida, &c. I saw, simultaneously with deficiency or consolidation of the vertebræ, deficient ribs on one or both sides; for instance, the five lower on the left side, in No. 2929.—v. *Seerig* D. de hydrencephaloceles specimine eximio, p. 12. 4to. Vratisl. 1824,—*Meckel*, Handb. der pathol. Anat. Vol. I. p. 201, found in an anencephalous monster only eight dorsal vertebræ and pairs of ribs. —*Morgagni*, Ep. an. med. XLVIII. note 50, saw in a monster without a skull, on the right side only eleven ribs; in a monstrous calf, on each side only four ribs; v. *G. Sandifort* Mus. anat. Vol. III. p. 295, No. 1010.—In a child with spina bifida, only ten ribs; v. *Seidel* Index Musei anat. Kiliensis, p. 2, No. 12.

(3) The twelfth rib is frequently wanting on one or both sides; for instance, *Böhmer* Obs. anat. rar. Fasc. I. Præf. p. vi. No. 2.—In two skeletons in Kiel Mus. v. *Seidel*, No. 3 and 6.—In one case I saw the eleventh rib wanting, with the left half of the spine. v. Selt Beob. I. p. 15, Verzeichniss, No. 3018.—In an adult man, the third, fourth, and fifth ribs were wanting on the left side, as a

vice of formation. v. *Lallemand* in Ephémérides médicales de Montpellier, Vol. I. Févr. 1826.—Several instances in *Voigtel* Handb. der pathol. Anat. Vol. I. p. 324.

(4) Compare *Meckel* De duplicitate monstrosa, p. 28.—*Voigtel.*

(5) *Bertin* Osteologie, Vol. III. p. 142.—*Böhmer*, Fasc. I. Præf. p. vi. No. 3.—*van Doeveren* Spec. Obs. academ. p. 199 and 201.—*Hunauld*, p. 536.—*Ruysch* Diluc. velc obs., Cap. 4, Obs. 1.—*v. Haller* in *Boerhaave's* Prælect. ac. Vol. V. Part I. p. 74.—*Morgagni* Epist. V. p. 6, 10.—*Gemmil* Medic. Essays and Obs. Vol. V. Part I. p. 336.—Acta med. Berolin. Dec. I. Vol. IX. p. 58. N.—Five instances in *Meckel*, p. 30.—A case at Moscow, v. *Loder* Index Præparatorum.—A case in Bresl. Mus.—Nineteen pairs of ribs in a horse at Hanover. v. *Rudolphi* Bemerkungen, u. s. w. Vol. I. p. 74.—In the Veterinary School at Stockholm I saw in an ass, on one side of the first lumbar vertebra, a supernumerary rib full seven inches long.

(6) *Bertin.—Böhmer*, No. 2.—*Leveling* Observ. anat. rar. p. 145, tab. 5, fig. 3—5.—*Meckel* found this only on one side in an adult. v. his Archiv. f. d. Physiol. Vol. I. p. 6.—I have seen two instances. v. my Verzeichniss, No. 14 and 3011.—I saw a third in the Anat. Mus. at Christiana, in an adult; the ribs go one side as far as the middle in the one, but on the other to the breast-bone; and a fourth, at the Joseph Academy at Vienna, from an adult woman; the supernumerary ribs do not reach the breast-bone, *Potthoff* D. s. descriptionem casus rarissimi spinam bifidam totalem exhibentes. Berol. 1827, p. 11.

(7) And therefore the chest either completely or partially too narrow; I have several times found this congenital, especially in children with abdominal cleft and undeveloped lungs, also in some monstrous calves. v. my Selt. Beob. I. p. 6, and Verzeichniss, No. 3012.—*Fleischmann* De vitiis congenitis circa thoracem et abdomen, p. 7.—Also in later years we find the malproportion of the chest to the other parts of the body frequent, especially in consumptive persons.—Frequently the last rib is very short.

(8) I saw this most remarkably in a lateral cleft of the chest. v. *Fleischmann*, p. 6, § 5, tab. 1, fig. 2.—I also have seen it several times as a vice subsequently originating in diseases of the chest, as the chest conforms itself to the form of the viscera it contains; if therefore one lung have not its proper bulk on account of tubercles, hepatization, compression, &c., so is the chest not properly developed on that side. In a child which had for a long while laboured under empyema of the left side, I saw the chest distinctly compressed on that side.—Similar cases are described by *Malmstrom* Præs. *Florman* De insolita costarum depressione, etc. 4to. Lundæ, 1807.—*Sommer* in *v. Gräfe* and *v. Walther's* Journ. f. d. Chir. Vol. VII. Part IV. p. 605.—*Celloez* in Journ. de Médecine, Vol. XVIII. p. 161.—*Laennec* Sur l'auscultation immédiate, etc.—In other cases is the one half of the chest very much enlarged by prominence and expansion of the ribs, as well as distortion of the spine, from the collection of water or pus in one of the pleura; here also I have some examples.—*Pitcairn* in Med. chir. Trans. of Edinb. Vol. II. 1826, describes a case of this kind in progress.

(9) For example, in a case which I have described in my Selt. Beob. I. p. 6.—Sometimes there are only single ribs so thick; to wit, the seventh, in No. 2929, of Bresl. Mus. v. *Seerig.*—Or with other thinness merely the anterior end of the rib very thick. v. *Fleischmann*, § 6.

(10) Sometimes we find this only on one, sometimes on several at once, especially if the fore extremity of the rib be cleft.—In *v. Soemmering's* Museum there is a rib an inch and a half broad. v. his work Vom Baue des menschlichen körpers. 2d edit. Vol. I. p. 340.

(11) *Albinus* Adnot. acad. L. II. c. 13, tab. 7, fig. 8.—Histoire royale de Médec. à Paris, 1779, pl. 3, fig. 5.—*van Doeveren* Spec. Observ. acad. No. 13, p. 203.—*Sandifort* Mus. anat. Vol. II. tab. 49, fig 3; Vol. III. p. 289, No. 991.—*Walter's* Anat. Mus. p. 185, No. 681—684.—*Meckel*, p. 29, mentions several such in his collection.—I have also found this formation seven times. v. Selt. Beob. I. p. 71, and Verzeichniss, No. 3445—3451.—*Kelch* describes a case in Beitr. zu pathol. Anatomie, No. 12. This cleft occurs, as it appears, only on the true ribs; also in animals, for instance, in cattle. v. *Sandifort*, Vol. III.

p. 289, No. 995, and p. 295, No. 1010; in the latter case another rib expanded into three extremities, as *Bertin* also observed in the human rib in the last described case.

(12) Very common, and in very different kinds, especially with distortion of the spine; in consequence of pressure from bandaging and lacing. v. *von Sömmerring* Ueber die Wirkungen der Schnürbrüste, 8vo. 2d edit. Berlin, 1793. — In monstrous sheep and calves, I have seen not merely the ribs unnaturally straight, but even bent inwards; to wit, in No. 3028 of my Verzeichniss. The distortion of the ribs, with that of the back and left chest, is peculiar to some races of cattle.—I have met with such an instance, v. my Verzeichniss, No. 3034. — *Sandifort*, Vol. III. p. 295. No. 1011. — *Cerutti* s. *Weese* De cordisectonia, p. 40. Berol. 1818.—I have seen this in two calves in the Veterinary School at Berlin.

(13) I saw this in the Anat. Mus. at Zurich.

(14) Especially in monsters with prolapse of the thoracic and abdominal viscera, though also in others; compare *Meckel* Handb. der pathol. anat. Vol. I. p. 93, ff. — *Sandifort* in Obs. anat. pathol. L. III. C. I. p. 16, describes a case, in which the greater number of ribs, of both sides, were not connected with the breast-bone; only the upper four ribs of the left side were joined to the breast-bone, *Kelch*, No. 18.—In a child with frenic hernia, I found the cartilages of the first three ribs not connected with the breast-bone. v. No. 2899 of my Verzeichniss. — In an adult there is another similar case, v. *Vallot* in the Journ. de Med. chir. et pharm. Nov. 1813. Vol. XXVIII.

(15) I found such a case on the right side in an old man. It was found on both sides by *Heusinger*. v. *Meckel's* deutsch. Archiv. f. d. Physiol. Vol. VI. p. 541, pl. 5, fig. 4 and 5.

(16) *Cheselden*, Osteographia, pl. 17, fig. 2. — *Albinus* Annot. acad. Vol. VII. L. II. p. 8.—*G. Sandifort* Mus. anat. Vol. III. p. 352, No. 312.

(17) I have found some examples of both vices.

(18) *Stoll* Ratio Medendi, Vol. VII. p. 1052.—I have found the cartilage of the second rib separated from the breast-bone by abscess. v. No. 3472 of my Verzeichniss.

(19) *Martin*, in Journ. d. Médec. Vol. LIV. p. 328.

(20) Engravings of it are to be found in *Sandifort*, Mus. Anat. Vol. II. pl. 41—43, 47. — Several examples are in Bresl. Mus.; it is very frequent in distortion of the back.—In a horse, *Sandifort*, Vol. III. p. 243, No. 700.

(21) Compare *Voigtel*, p. 230.—*Kaltschmidt* Progr. de costis duabus primis veris in dextro puellæ latere per interpositam substantiam osseam cohærentibus. Jenæ, 1767.—Many instances in *de Plouquet* Repertor. Art. Costar. symphisis.—*Sandifort* has many examples, and one very remarkable case, in which four ribs are completely united from behind to before, Vol. III. p. 289. No. 993. The same in two calves, No. 1000 and 1011. — *Meckel* noticed congenital consolidation in several cases; Handb. der pathol. anat. Vol. I. p. 201, 211.—*Rathke*, in *Meckel's* D. Archiv f. d. Physiol. Vol. VIII. p. 489, describes a congenital consolidation of almost all the ribs on one side.—In *Saxtorph's* Collection, at Copenhagen, I saw a skeleton of a child with deficiency of skull and cleft spine, in which all the ribs of both sides were consolidated in the middle.—I found this consolidation on three ribs, in No. 2929. v. *Seerig* D. de hydrencephalocelis specimine eximio, p. 12. 4to. Vratisl. 1824. — Further, in my Verzeichniss, No. 3453.

(22) *Morgagni* De sed. et caus. morb. Ep. XLVIII. note 50.—*Leveling* Observ. anat. rar. p. 153, tab. 5, fig. 6.—*Sandifort* Mus. anat. Vol. I. p. 180, 197, 198; Vol. II. p. 48, tab. 47, fig. 6 and 7.—*Rosenmüller* De singul. et nativ. ossium c. h. varietatibus, p. 55. — *Kelch*, No. XIII. — In a pig, *Blumenbach* Geschichte und Beschreibung der Knochen. 2d edit. p. 352.

(23) Of this I have several examples; and probably No. 3452 of my Verzeichniss belongs here.—In one case these leaf-like processes were joined by a suture. v. *Sandifort*, Vol. III. p. 289, No. 992.

(24) *Greding's* Sämmtl. medic. Schriften, I. p. 333.

(25) Extensive ossification of the cartilages of the ribs, especially in the form of little bony plates and scales in the membrane of the cartilages, I found

common, particularly in consumption, and also in tubercular disease. It has also been seen in animals; for example, in a horse. v. *G. Sandifort* Mus. anat. Vol. III. p. 288, No. 982.

(26) *Viole* Diss. de costarum fractura. Paris, 1788. — *Vacca Berlinghieri* Mémoire sur les fractures des côtes, in Mém. de la Soc. médic. d'émulation. Ann. III. p. 151.

(27) *Sandifort* Obs. anat. pathol. L. III. C. X. p. 135.—*van Doeveren* Specim. obs. acad. Cap. XIII. p. 204.—Some of the fractures of the ribs of horses, oxen, and sheep, related by *G. Sandifort*, Mus. anat. Vol. III. p. 185, ff. No. 243—246, 249—252. p. 381, No. 580, belong here. One example in an ox, in the Strasburg Mus. v. *Kilian* Anatom. Untersuchungen über das neunte Hirnnervenpaar, p. 136.

(28) *Meckel* Beiträge zur vergl. Anatomie, Vol. I. Part II. p. 138.—I once found this in some ribs of a monstrous calf, and of a monstrous sheep, No. 3028 of my Verzeichniss.

(29) *Ruysch* Observat. XXXVII. — *Morgagni* De sed. et caus. morbor. Epist. XVII. p. 25; Epist. XXIII. p. 25; Epist. XXVI. p. 5. — *Walter* Anatom. Mus. Vol. II. p. 103, No. 560; p. 114, No. 561; p. 121, No. 563. — *Baillie*, Morbid Anatomy.—I have found it thrice. v. below, on Aneurysm. — *Janin* in Bulletin de la Soc. médic. d'émulat. July, 1817.—*Salomon* in Petersburg. vermischt. Abhandl. 1825, p. 164.

(30) *Bleuland* Icones anat. pathol. Fasc. II. pl. 8.

(31 A remarkable exostosis attached to the ribs and breast-bone of a horse, measuring seven inches in every diameter, I saw at Alfort; it is, probably, the same which *Grognier*, in Journ. de Médec. contin. Dec. 1810, p. 505, described. — *Ekström* found a cartilaginous exostosis, weighing several pounds, which included six ribs. v. Ars. Berättelse om Svenska Läkare-Sällskapets Arbeten. Stockholm, 1826.

§ 137.

The BREAST-BONE is sometimes entirely WANTING, or is often very imperfectly formed in monsters with acephaly and prolapse of the viscera of the chest and belly. In the latter it is also frequently cleft throughout its whole length, or only at the upper, middle, or lower part.[1] We, however, miss in rare cases, without prolapse of the viscera of the chest, and when the common integuments are undivided, the whole or part of the breast-bone; or it is found cleft.[2] The lowest degree of this formation is in the common perfect division of the point of the breast-bone;[3] not unfrequently there is a hole in the lower part of the breast-bone;[4] the bony kernels lying together in pairs, and their often long-continued existence in that state,[5] and the too late and too incomplete ossification of the breast-bone.

Variations as to SIZE and FORM occur very frequently in the breast-bone,[6] sometimes to a remarkable degree; thus, for instance, we see it remarkably short,[7] small, or on the contrary, very long,[8] broad,[9] bent inwards, unusually arched and projecting, or arched and malformed in other directions.[10]

As to VICES OF CONNEXION, we observe in the later period of youth, and even in manhood, that the original bony kernels remain unconsolidated. There is a kind of articular motion

between the handle and the body of the breast-bone, which has been observed not merely in very narrow-chested children,[11] but sometimes even in adults.[12] Frequent is the opposite vice, the complete immobility of the breast-bone, in consequence of anchylosis of its pieces.[13] Once there was found an unnatural ligament on the breast-bone.[14]

We must mention among the VICES OF CONSISTENCE, imperfect fractures or cracking of the breast-bone, and its complete fractures,[15] which appear not rarely as distinct longitudinal and transverse fractures. One longitudinal fracture of this bone remained ununited through life.[16]

Lastly, as to VICES OF TEXTURE in the breast-bone; here especially must be mentioned the not unfrequent RICKETY and INFLAMMATORY POROUSNESS, and LOOSENESS,[17] the frequent EROSION and PERFORATION, of the breast-bone by aneurysms of the arch of the aorta,[18] CARIES,[19] which not unfrequently arises from scrofulous glands and from abscesses within the anterior mediastinum, and as a more rare condition, SPINA VENTOSA,[20] EXOSTOSES,[21] and OSTEOSARCOM.[22]

(1) v. *Wiedemann* Ueber das fehlende Brustbein. Braunschw. 1794.—*Meckel* Ueber Spaltungen der vorderen Körperflache, v. Handb. der pathol. Anat. Vol. I. Sect. II. p. 93.—*Fleischmann* De vitiis congenitis circa thoracem et abdomen. p. 1, tab. 1.—My Selt. Beob. I. p. 64.—In a child with a large umbilical rupture; I have however since seen cleft of the breast-bone in three human monsters, and in one monstrous calf; in another calf both halves of the breast-bone with their ribs were curved back on the spine. v. *Sandifort* Mus. Anat. Vol. III. p. 295, No. 1011.—No. 3034 of Bresl. Mus. is similar.—An instance of deficient formation of the breast-bone, with prolapse of the heart, is described by *Chaussier* in the Bullet. de la fac. de Méd. de Paris.

(2) *Ficker* Beiträge zur Arzneiwiss, Part I. p. 76.—*Wiedemann.*—*v. Sömmerring* Vom Baue des menschlichen Körpers. 2d edit. Vol. I. p. 347, note 5.—*Chaussier.* in a man of twenty-seven years, there was only the manubrium present.—Deficiency of the lower part of the breast-bone in a young person. v. *G. Sandifort,* Vol. III. p. 393, No. 662.—*Cullerier* in Journ. gén. de Médec. No. 292, saw it divided to the lowest extremity in a woman of thirty-one years. In a calf with two supernumerary feet on the breast, the sternum is completely divided or remarkably doubled, without any ribs between. v. No. 3031 of my Verzeichniss.

(3) I have found these clefts very wide in several children with umbilical or ventral ruptures; in many instances, instead of a cleft there have been one, more rarely two holes in the ensiform cartilage.

(4) I have four examples before me; in one case, where the lower part of the breast-bone was wanting, I found in the middle very broad part, consisting of several pieces, a hole covered with membrane. v. *Sandifort* Mus. Anat. Vol. III. p. 898, note 662.

(5) Two symmetrical bony germs, close to each other, in the handle of the breast-bone. v. *Meckel* in Beiträgen zur vergl. Anat. Vol. II. Part I. p. 145, pl. 1, fig. 8. Handb. der pathol. Anat. Vol. I. p. 115; and myself in one case. v. Selt. Beob. I. p. 7.—I have seen these bony germs lying symmetrically in pairs in the middle pieces in four young skeletons, and indeed even in two boys nearly sixteen years. v. No. 7 and 8 of my Verzeichniss.

(6) *Eustachius* in Ossium examen, p. 197 and Tab. anatom. tab. 47, fig. 18—21.

—*Albinus* Icon. ossium Fœtus, p. 75—95.—*Sandifort* Mus. anat. Vol. I. p. 179, No. 191—193, 196; Vol. II. tab. 46.—The cartilaginous tip of the breast-bone particularly also varies in respect to size and form.

(7) In children with cleft of the belly, large umbilical rupture, and in other cases in which the chest, in proportion to the belly, is not properly formed; I saw the latter once, as it were, with remarkable breadth, in a child with rachitis congenita. v. my Selt. Beob. I. p. 6. It sometimes appears very short, if the point of the cartilage be either deficient or very small.

(8) In one monster it reached to the symphysis pubis, with which it was connected by cartilage. v. *Marrigues* in the Mém. de Mathém. prés. à l'Acad. des Sc. Vol. IV.—Sometimes the ensiform cartilage alone is remarkably long, reaching down to the navel.

(9) *Blumenbach*, Geschichte und Beschreib. d. Knochen. 2d edit. p. 365, note 1, mentions a breast-bone in his collection nearly as broad as the hand; several are before me almost as broad at the lower part.—In a double monster with two spines, but only one chest and breast-bone, the latter as a trace of duplication is very broad, and consists of a double row of bony kernels. v. No. 3028 of my Verzeichniss.

(10) It is often very much curved, especially outwards, as consequent on deficient development of the chest, of rachitis, distortion of the spine, and mechanical influence. Compare *van dem Bosch* Anatomia systematis respirationi inservientis pathologica, p. 65. 4to. Haarlem, 1801. — *Biermayer* Museum anat. pathol. No. 99 and 457.—My Verzeichniss, No. 3022, 3331, 3332, 3335, 3465, and 3466.—To these belong the projecting or hawk breast of horses; the chest of birds is frequently distorted. I have seen this in fowls, pigeons, geese, ducks, guinea-hens, heath-cocks, and a buzzard. Sometimes the ensiform cartilage is strongly bent from internal or external disease. v. *Codronchius* De morbo novo s. prolapsu cartilaginis mucronatæ, in his work De morbis, qui Imolæ vulgati sunt. 4to. Bonon. 1603.—*Septalius* De morbis ex mucronata cartilagine evenientibus. 8vo. Mediol. 1632.—*Pico* Histor. natur. Brasil. p. 36. —*Troschel* De morbis ex alieno situ partium abdominis. Francof. § 28. a. V. 1754.—The breast-bone was uncommonly twisted and deformed, as a vice of formation, in an adult. v. *Vallot* in Journ. de Méd. Chir. et Pharm. Nov. 1813, Vol. XXVIII.

(11) *Blumenbach*, p. 367, note m.

(12) *Beauehène* Observation sur une sorte d'articulation contre-nature, entre les deux premières pièces du Sternum in *Sédillot* Rec. période. de la Soc. de Médec. de Paris, Vol. XXXIII. p. 287.—*Heusinger* in *Meckel's* D. Archiv für die Physiologie, Vol. VI. p. 541, tab. 5, fig. 4 and 5.—In diseases of respiration;—I have also once found it in a man who died of asthma.

(13) I have found this several times.—Many such instances are given by *Sandifort* Mus. anat. Vol. I. No. 186—189; Vol. II. tab. 46; Vol. III. p. 237, No. 640—642, 646—650.

(14) *Kelch*, No. 11, p. 8; it lay loosely on the external surface of the breast-bone, and descended from a transverse ridge between the insertion of the third pair of costal cartilages, down to the ensiform cartilage, and to the sixth pair.

(15) *Busnel* D. de fractura sterni. Paris, 1761.—*Sabatier* Mémoire sur la fracture du sternum in Mém. de l'Institut. nation. de Paris. Sc. Mathém. et Phys. Vol. II. Mém. p. 115. — *Fr. Haugk* D. de fractura sterni et vertebrarum. 4to. Lips. 1816.—Compare several cases in *de Plouquet* Repertor.—A case of longitudinal fracture in Dict. des Sc. médical. Vol. LII. p. 576. — Two cases of transverse fracture from muscular action were observed by *Chaussier*. v. Revue medicale, 1827. Vol. IV. p. 260.—A third in *Cruveilhier*.—I have found one case. v. No. 3474 of my Verzeichniss.—A remarkable union of a fracture in a fowl, described by *Tilesius* in Mém. de l'Academ. des Sc. de Petersburg. Vol. VI. p. 44.—A transverse fracture from violent exertion in labour. v. *Compte* et *Martin* in Revue Medic. franc. et étrang. Nov. 1827. Vol. IV. with engravings.

(16) *Meyer* Samml. medic. Beobachtungen, p. 714.

(17) I have seen several instances of both.—Cases of inflammatory swelling

are described by *Howship*, Pract. Observat. in Surgery and morbid Anatomy, case 51—53.

(18) *Verbrügge* D. de aneurysmate, etc. L. B. 1773, tab. 1 and 4.—*Frank* De cur. hom. morb. L. V. 2. p. 40.—*Baillie*, Morbid Anatomy.—*Breschet* in Journ. de Méd. Chir. et Pharm. 1813. Vol. XXVI. p. 365.——I have found it four times. v. Selt. Beob. II. p. 64. — Verzeichniss, No. 2257 and 2258; and since two cases.—*Heisler* D. rariorem atque memoratu dignissimam aneurysmatis aortæ sternum perforantis historiam exhibens. Landshut. 1817.—*Sandifort* Mus. anat. Vol. III. p. 347, No. 288.

(19) v. *Reuss* Repertor. Comment. Vol. XII. p. 243.—*de Plouquet* Repertor. Sterni Apostema.—*Biermayer* Mus. anat. pathol. No. 143, from Syphilis.—*Lobstein* Compte rendu, etc. Strasb. 1824, p. 63, No. 51 and 52.—*Sandifort* Mus. anat. Vol. I. p. 178, No. 184, 185; Vol. III. p. 207, No. 381; p. 347, No. 288.—I have found three cases, v. my Verzeichniss, No. 3471—3473.—In rare instances, the breast-bone is entirely destroyed, and the opening in the chest filled up by adherence of the opposite ribs. v. *Schenk* Obs. med. L. II. Obs. 171 and 172, p. 367.—Gazette salutaire de *Bouillon*. 1789. v. *Hufeland's* Neuste Annalen der franz. A. Wiss. Vol. I. p. 420.

(20) An instance from the Strasburgh Mus. is mentioned by *Kilian* Anat. Untersuchungen über das neunte Hirnnervenpaar, p. 136.—A very striking instance in a hen in the Anat. Mus. of the University at Vienna.

(21) *Lobstein*, No. 53; and a case in a horse at Alfort. v. above, § 136, note 31.

(22) *Sandifort*, p. 349, No. 301.—*v. Gräfe*, 11ter Jahresbericht über das klinische chir. und augenärztl. Institut. Berlin, 1827, p. 18. [In the Mus. St. Thomas's Hospital there is a preparation of scirrhous tubercles in the sternum; and from the same person tubercles of the like kind in the thigh bone, which was fractured merely in rising in bed, consequent on the absorption of the shell of the bone. T.]

§ 138.

The PELVIS[1] is, in rare cases of different kinds of monsters, found partially DEFICIENT; thus we miss the sacrum together with the coccyx,[2] or a part of the lateral pelvic bones in absence of one lower extremity,[3] in the cleft pelvis,[4] and in the syren formation; in the latter case we frequently observe the lateral parts of the pelvis consolidated, whereby the pelvis itself is closed at its lower part, unossified, and more or less malformed.[5] On the contrary, in monsters, we frequently notice the pelvis in various ways either completely or partially DOUBLE, and as it were, two united into one.

The SIZE and FORM[6] of the pelvis is very often, as an original or acquired vice, irregular; thus it varies in reference to its breadth in both directions from the normal mass; it may be too narrow,[7] or too wide;[8] it is variously formed as to its particular diameters, its cavity, direction, and inclination; and sometimes in consequence of softening of the bones, it is found awry and crooked in very many ways.[9] Even in adults the form of the pelvis is sometimes very distinctly altered by osteomalacy,[10] fractures, dislocations, &c. The pelvis is also frequently irregular as to its ARTICULAR CAVITIES; not merely, as might be supposed, in deficiency of the lower extremities, but even

when they exist, these cavities are entirely wanting;[11] or in monsters with consolidated lower extremities, they are not double, but form only a single cavity, placed at the under and fore part of the pelvis, and may be too flat, too narrow, too deep and wide, oval, triangular, and malformed in other ways;[12] the acetabula indeed are often very much altered and even much widened in later life by various diseases;[13] should the dislocated head of a thigh bone remain unreduced, the original socket becomes narrowed and flattened by absorption and contraction, or by being filled up with cartilaginous and bony substance, and in its stead a pit and a more or less perfect new socket is formed, where the head of the bone rests.[14]

The CONNEXION of the bones of the pelvis with each other also sometimes exhibits certain irregularities; to these belong, the late consolidation of the hip, haunch, and share-bones with each other in weakly persons;[15] the crest of the hip-bone with itself;[16] the want of junction of the share-bones in congenital protrusion of the bladder;[17] sometimes also great mobility on the sacro-iliac joint; the rare complete relaxation,[18] or rupture of the pelvic ligaments, whence dislocation of the lateral bones arise;[19] and lastly, the ossification of these ligaments; consequent to which is the true anchylosis of the ilium with the sacrum,[20] or more rarely of both the pubic bones.[21]

VICES OF CONTINUITY OR FRACTURES OF THE PELVIC BONES,[22] naturally and very easily occur, not merely in consequence of external violence, but also from difficult labour, and even from violent muscular exertion, and are not unusually united pretty much out of shape, on account of the difficulty of fixing them with bandages.

Among the VICES OF TEXTURE which affect the pelvis, deserve to be particularly mentioned, partly on account of their frequency, partly on account of their connexion with midwifery, the SOFTENING, SWELLING, AND FRANGIBILITY of the bones of the pelvis produced by rickets, scrofula, gout, syphilis, &c.; next, CARIES and SPINA VENTOSA, which here not only easily arise from the same causes as in other bones, but frequently also from lumbar abscess, *decubitus*, cancer of the rectum, and especially from diseases of the hip-joint, and also coxarthrocacy; and lastly, EXOSTOSIS[23] and OSTEOSARCOM,[24] both of which are here as frequent as they are large.

(1) *Jördens* De vitiis pelvis muliebr. rat. partus. 4to. Erlang. 1787.—*Creve* Von den Krankheiten des weiblichen Beckens. 4to. Berlin, 1795, with eleven engravings.

(2) *G. Sandifort* Mus. anat. Vol. III. p. 294, No. 1009, in a calf; the hind legs with the ossa innominata attached to the last lumbar vertebra. In another case, only the posterior part of the sacrum with the tail, *ib.* No. 1010. —*Bonn* in

Verhandel. van het Genootschap ter bevordering der Heelkunde. Amsterd. D. III. p. 124, in an acephalous monster.—Myself in a syren monster, No. 3015 in Bresl. Mus.

(3) I have found this a few times in men and animals; viz. in No. 2902 of my Verzeichniss.—In a full-grown pig, with deficient right hind leg, I found the right half of the pelvis very small, and the ischium entirely wanting. v. No. 3027.—*Saxtorph*, Gesammte Schriften von *Scheel*, I. p. 314, Copenhagen, 1823, missed the hip-bone at the same time with a lower extremity.—*Vrolick* Mémoires sur quelques sujets intéressans d'Anatom. et de Physiol. trad. par *Fallot*. 4to. Amsterd. 1822, pl. 3, fig. 1 and 2.—*Heusinger* in his Zeitchrift f. die organische. Physik. Feb. 1828. Vol. II. Part II. p. 208.

(4) *Warwick* in Philos. Transact. Vol. XLII. No. 464, p. 152, ff.; and *le Sage*, in *Roux* Journ. de Médec. Vol. XXXV. 1788, p. 221, ff. missed the pubic bone.

(5) See below, in the extremities, the observations on the syren formation; in No. 2903 Bresl. Mus., the coccyx is deficient, and the outlet of the pelvis almost closed.

(6) *Büchner* resp. *Schiffert* D. de difficultate pariendi ex mala conformatione pelvis. Halæ, 1756.—*Thierry* D. de partu difficili a mala conformatione pelvis. Argentor. 1764.—*Choulant* Decas pelvium spinarumque deformatarum. 4to. Lips. 1818; and Decas secunda, adjectis nonnullis adnotationibus. 4to. Lips. 1820.—*K. W. Schwabe* D. de pelvi ejusque deformationibus. 4to. Jenæ, 1828.—According to *J. M. Weber*, the form of the pelvis is always in reference to that of the head in malformed skeletons, which I have, however, not found constant. v. Nov. Act. Phys. Med. Acad. Nat. Cur. Vol. XI. Part II. p. 411, pl. 1; and Specimen malæ conformationis encephali, capitis et pelvis viri. 4to. Bonnæ, 1828.

(7) It seems to me that the size of the pelvis, equally with the skull, the chest, &c. generally depends on the viscera it contains; in the higher degree especially, which originates in deficient development of the generative organs. I have thus found in two adult women the generative organs of the size of those of a child of ten years old, and the pelvis at the same time remarkably small. A similar case was recently shown to me by Professor *Lauth*, of Strasburg. Also in monsters with deficiency of the rectum, or of various kinds of retarded formations in the generative organs and lower extremities, I have seen the pelvis very small. I have also found the ilium and ischium sometimes in anchylosis, unreduced dislocations, and lameness of one lower extremity, very much wasted.

(8) *Ebermaier* D. de nimia pelvis muliebris amplitudine, ejusque in graviditatem et partum influxu. 8vo. Goett. 1797.—In congenital prolapse of the bladder the pelvis is usually very spacious, especially too broad.

(9) Compare my Verzeichniss, No. 3019—3025, 3383—3425;—in No. 3020 and 3025 are the pubic bones compressed laterally and closely, and project like a fold;—in No. 3023 the projection of the junction of the left ilium and os pubis is so great, that there seems to be formed two upper apertures to the pelvis. Descriptions and engravings of very mishapen pelves are given by *Sandifort* in Museum anat.—*Walter* in Mus. anat., *Köhler*, *Voigtel*, &c.—In distortion of the spine the form of the pelvis is usually affected, especially in scoliosis.—[In the Mus. Roy. Coll. Surg. No. 623, is a cast of a female pelvis, in which the upper aperture of the pelvis is only an inch wide between the pubes and sacrum. T.]

(10) *de Fremery* De mutationibus figuræ pelvis, præsertim iis, quæ ex emollitione ossium oriuntur. Lugd. Batav. 1793.—*Wood* in *Bradley's* med. and phys. Journ. 1801, No. 32.—*von Siebold's* Journ. f. Geburtshülfe, Vol. III. Part II. 1821.—Those cases are more rare in which a too narrow pelvis expands. v. *Rust's* Magaz. f. d. gesammte Heilkunde. 1825.—[No. 624, Mus. Roy. Coll. Surg. is a cast of a female pelvis distorted in consequence of mollitus ossium, in which the pubic bones are compressed and project forwards, and the acetabula are on the front of the pelvis. T.]

(11) They are wanting on one side, as causes of congenital lameness. v. *Schreger* chir. Versuche, Vol. II; their entire absence, or mere rudimentary state, was noticed by *Dupuytren* in Repert. gén. d'Anat. et de Physiol. pathol. Vol. II. sect. 3, p. 150.

(12) *Palletta* Exercit. de claudicatione congenita, L. B. 1787, and Exercit. pathol. Vol. I. p. 64—92.—*Prochaska* found the acetabula in a cretin very wide, flat and mishapen. v. Disquis. Anat. phys. organ. c. h. tab. 11, fig. 1. Sometimes we find, without disease, a hole in the bottom of the acetabulum merely filled by membrane.

(13) I have described in my Selt. Beob. II. p. 9, No. 9, a remarkable case, viz. a great projection of the bottom of the acetabula on both sides, like a bladder, into the pelvis. v. Verzeichn. No. 3425. Not unfrequently the acetabulum appears deeper than it should be, in which case its fibro-cartilaginous edge is ossified, or bony matter of some kind is deposited around the edge of the cavity.—[No. 198, Mus. Roy. Coll. Surg. is a fine example of ulceration of the acetabulum, by which an aperture was made through its centre into the pelvis. T.]

(14) *Sandifort* Mus. Anat. Vol. II. tab. 64—68.—*Palletta* Exercit. path. I fig. 11, engraves an os innominatum, with three pits, on which at different times the head of the thigh-bone was seen.—*Loder* Index præparat. II. sect. A, describes a new acetabulum above the crest of the right pubic bone; and the reviewer in *Rust* and *Caspar's* Krit. Repert. Vol. XV. Part III. p. 432, mentions a similar case in the midwifery school at Bamberg.—Good engravings of such new acetabula are given in *Cooper* and *Travers's* Surgical Essays, Part I. Three cases are found in Bresl. Mus. v. my Verzeichn. No. 3440—3442 and 3443.—*Tenon*, in Mem. de Paris, 1770, Hist., p. 54, describes a rare similar instance in a horse.

(15) Not even in the seventeenth year; *de Fremery*, p. 14.

(16) I have seen this a few times in rickety persons, some twenty years old.

(17) Compare the writers on congenital prolapse of the bladder, below, on the Bladder. The pubic bones are often distinctly separated from each other, in adults, to one-third of an inch; they are generally connected by a small tendinous band. At present we have only *Walter's* observations on the non-union of the pubes without prolapse of the bladder. v. De dissectione Synchondroseos ossium pubis in partu difficili, p. 22. Berol. 1782.

(18) We find the old disputes and opinions about the existence of such laxity of the pelvic ligaments, especially in *Michel* De utilitate Synchondrotomiæ pubis in partu difficili, p. 4 and 5. Lug. Bat. 1781; and *de Plouquet* Repert. Art. Pelvis Discessus.—Instances of separation of the pubic joint in natural labour are noted by *Eichelberg* in *Rust's* Magazin. f. d. ges. Heilk. Vol. XVII. Part III. p. 550, and *Nicholson* in the Transact. of Physicians in Ireland. Vol. IV. 1824.—More remarkable are the instances in which in children the bones of the pelvis were very movable; such were observed by *Deventer.*—*Alix* Observat. chirurgica, Fasc. III. p. 60.—*Palletta*, p. 89.—In a woman the pelvis was so movable every time she became pregnant, that she was unable to stand. v. *Frank* in *Textor's* Neuem Chiron. Vol. I. Part II. p. 261.

(19) *Enaux* in Nouv. Mémoires de l'Académie de Dijon, Vol. VIII. No. 6, 1784, sect. I.—*Louis* in Mémoires de l'Acad. de Chir. Vol. IV.—*Creve*, p. 137. —I have seen one instance of subluxation. v. my Verzeichniss, No. 3417.— —The so-called dislocation of the os coccygis is more probably fracture.

(20) Many such cases are collected by *Creve*, p. 164.—Individual cases described by *Desgranges* in Anc. Journ. de Médec. Vol. LXVIII. p. 85.—*Lamorier* in Mémoires de Montpellier, Vol. II. Mém. p. 243.—*Sandifort*, Mus. anat. Vol. I. No. 217—232, 242, 246; Vol. II. tab. 61—63; Vol. III. p. 219, No. 459; p. 223, No. 492; p. 237, No. 651—656; p. 385, No. 605.—Seven instances are described by *Bleuland* Descr. Mus. anat. p. 257, No. 1390–1396.—Engravings are also given by *Sandifort* from *C. O. Wagner* D. de ancylosi ossium pelvis. 4to Heidelb. 1818; and *Weidmann* D. de comparatione inter sectionem cæsaream et dissectionem cartilaginis et ligamentorum pubis. Wirceburgi, 1779, tab. 2, fig. 1.—I have found sacro-iliac anchylosis six times. v. No. 3387, 3410, 3414. [No 308, and 309, Mus. Roy. Coll. Surg. are examples of anchylosis at the sacro-iliac joint.—There are also some examples in the Mus. at St. Thomas's Hospital. T.]—It also occurs unnaturally in mammalia, especially in horses, asses, and oxen.

(21) This is often doubted, though improperly. Instances are given in

Sandifort, Vol. I. p. 190, No. 216; Vol. II. tab. 63; Vol. III. p. 238, No. 657—659; p. 385, No. 607 and 608.—*Walther*, p. 14.—*Köhler* Beschreib. der Präparate des Hrn. *Loder*, p. 11, and *Loder's* Index Præparator.—I saw one case in Anat. Museum at Heidelberg, and another in *Meckel's* Museum.—Older cases in *Creve*, p. 168, and pl. 11.—Also in those animals in which anchylosis of the pubis is not normal, it occurs as an exception, viz. in monkeys, many kinds of dogs, &c.

(22) *Maret* Sur les fractures des os du bassin in Mémoires de Dijon, Vol. II. p. 85.—*Creve* D. de fractura ossium pubis. Mogunt. 1792; and on fracture of the pelvic bones, in his treatise Von den Krankheiten des weibl. Beckens, p. 13—18.—*Sandifort*, Vol. I. p. 178, No. 182; Vol. II. tab. 45, fig. 5—7, (a fracture of the sacrum united at an angle,) tab. 63, Vol. III. p. 199, No. 331; p. 204, No. 358. Compare No. 3416, 3430, 3431, my Verzeichniss.—In horses, fractures of the pelvis occur from muscular exertion. v. *Albers* in Salzburg. medic. chir. Zeitung, 1808, I. p. 233.—I saw a similar case in the veterinary school at Copenhagen; a fractured pelvis of a horse, united, in the veterinary school at Dresden; and a human pelvis, fractured in difficult labour, at the Hospital of St. Anna, at Brünn.—In rare cases fractures of the pelvis occur, in which the head of the thigh-bone passes through the acetabulum. v. *Lawson* in Edinb. Med. Com. II. Dec. III. p. 28.

(23) *van Doeveren* Specim. observ. acad. Cap. XII. p. 177.—*Stark* in *Baldinger's* Neuem Magazin. Vol. VI. p. 73.—*van Heekeeren* De osteogenesi præternaturali. L. B. 1797, fig. 4.—*Murray* in neue Samml. der auserless und neuesten Abhandl. für Wundärzte, Vol. II. p. 79.—*Wichert* D. de excrescentiis præternaturalibus ex interiori pelvis muliebris superficie, etc. 4to. Gött. 1797.—*Autenrieth* resp. *Silber* D. de viribus naturæ medicatricibus in situm fœtuum iniquum. Tübing. 1799, p. 31.—*Sandifort* Mus. anat. Vol. II. tab. 62.—*Duret* in Bulletin de l'Ecole de Médecine et de la Soc. de Paris, 1810, p. 148.—*Bail* D. de ossium luxuriatione. 4to. Berol. 1820, fig. 1.—*von Persyn* D. de exostosium atque osteosteatomatum pelvis muliebris influxu in partum. 8vo. Berol. 1821.—*Frank*.—I have found several. v. No. 3386, 3387, 3393, 3403, 3405, 3428, 3429, my Verzeichniss, and one as big as the fist, and hard, deep in the pelvis of a very rickety boy.—Exostosis on the pelvis in the region of acetabulum is very common in coxarthrocacy, dislocations, fractures of the neck of the thigh-bone, and gouty affections of these parts. v. engravings of them in *Sandifort* Mus. anat. Vol. II. tab. 67—74, 79.—Also in animals exostoses occur on the pelvis.—I have seen several on the ilium in horses.—One weighing three pounds on the pelvis of an ox. v. *Pilger's* Handbuch der Veterin. Wissensch. Vol. II. p. 1819.—Exostosis around the carious acetabulum of a pig. v. *Sandifort*, Vol. III. p. 241, No. 681.—In the same animal I have found exostosis on the spine of the ischium, and many small ones on the pubic bone and acetabulum in a kangaroo.

(24) *Herrmann* D. de osteosteatomate. Lips. 1767, p. 23.—*Boyer* Traité des maladies chirurgicales, Vol. III. p. 594.—*Pascal* in *Graperon's* Bulletin des Scienc. médical. Vol. II. p. 265.—*Bang* in Actis Regiæ Societ. med. Havniensis. Vol. V. No. 8, 1818, (above twenty pounds weight.)—*Biermayer* Mus. anat. pathol. No. 153, (four pounds, in a child.)—*Sandifort* Mus. anat. Vol. III. p. 286, No. 972; p. 349, No. 302—305; p. 391, No. 641.—At *Saxtorph's*, in Copenhagen, I saw one so large that it almost filled the whole pelvis.

C.—OF THE BONES OF THE UPPER EXTREMITIES.

§ 139.

The COLLAR-BONES are occasionally wanting together with the blade-bones in monsters which have no upper extremities; they are, however, missed in rare instances, entirely[1] or partially,[2]

4xx Dislocation of the Clavicle behind the Sternum in consequence of distortion of the Spine
Daveys Case in Coopers Lectures on Surgery by Tyrrell Vol III. p. 296

although the latter exist. They vary exceedingly in length, thickness, flexibility, &c.; thus in imperfect evolution of the chest, they are often very short, very thick and broad, too thin in atrophy of the arms,[3] too straight in deficiency of the upper extremities, and in women who have worn stays from their youth,[4] and the like. DISLOCATIONS[4*] of the collar-bone even on the blade-bone are rare, still more so on the breast-bone; as also are ANCHYLOSES;[5] but FRACTURES[6] are very common even merely from muscular exertion.[7]

VICES OF TEXTURE occur proportionally but rarely on the collar-bones; however, rickety expansion, erosion from aneurysm, caries, necrosis, and osteosarcom,[8] have been observed.

(1) In Acephala. v. *Henkel* Neue Bemerk. 1st. Samml. p. 60. — *Meckel* Abhandl. aus der mensch. und vergl. Anat. p. 165 and 173.—In children with cleft breast. v. Mém. de Paris, 1760, p. 58.

(2) I have a few times seen the inner extremity wanting in cleft chest, as also the outer, in absence of the upper extremities.—In an adult the outer fourth of it was hereditarily wanting, and was attached by a little thin process to the coracoid process. v. *Martin* in *Roux* Journ. de Méd. Vol. XXIII. p. 458.—In a cretin the outer half of both were deficient, and their place supplied by ligament. v. *Prochaska* Disquis. anatom. phys. organ. c. h. expl. tab. 8.

(3) v. Selt. Beob. II. p. 32.

(4) *Sabatier* Tr. d'Anat. Vol. I. p. 172.

(4*) [In the course of the last spring, I saw a dislocation of the sternal end of the clavicle behind the sternum, in a man, which did well. T.]

(5) I know no instance of its occurrence at the sternal extremity; at the scapula many are related. v. *Köhler* Beschreibung der phys. und pathol. Präparate, u.s.w., p. 11, No. 39. — *Sandifort* Mus. anat. Vol. III. p. 239, No. 660.

(6) *Ph. Wilhelm* Ueber den Bruch des Schlüsselbeins. 8vo. Würzburg, 1827, with engravings.

(7) *Churchill* in the Lond. medic. Repository, April, 1822, p. 289.

(8) *Kulmus* resp. *Möhring* D. de exostosi steatomatode claviculæ ejusque felici sectione. 4to. Gedan. 1732. — *von Gräfe* in 11ten Jahresbericht des klin. chir. Instituts. Berlin, 1827, p. 18. -- [A very excellent case of osteosarcoma of the clavicle, in which this bone was removed by *Mott*, of New-York, is given in Med. Gazette, Vol. III. p. 405. T.]

§ 140.

In imperfect development of the upper extremities we notice, in rare cases, the BLADE-BONE DEFICIENTLY FORMED, sometimes it is too small, too narrow, or cartilaginous, and terminating in a round tubercle instead of an articular cavity, &c. In imperfectly formed upper extremities its form is also sometimes irregular; thus we find it cleft, as a congenital formation;[1] imperfectly ossified;[2] its hinder edge sometimes straight, sometimes more rounded; and especially in rickety softening, more or less curved.[3] The point of the spinous process (acromion) is sometimes a distinct and even movable piece.[4] If the posterior ligament be ossified, we find a hole instead of the semilunar notch in the upper edge of the blade-bone.

If the dislocated upper-arm-bone be not replaced, the form of the original socket is changed, and at that part of the bone on which the dislocated head rests, a kind of new socket is produced.[5] Anchylosis of the blade-bone with the upper-arm is very rare.[6] FRACTURES,[7] on account of the exposed position of the blade-bone, are not very unfrequent, and especially the complete transverse fracture;[8] such fractures generally unite perfectly well; shot and other wounds however remain open for a long while,[9] or if there be a fracture and it do not unite, an unnatural joint is produced.[10]

Among the VICES OF TEXTURE, which occur in proportion but rarely, in the blade-bones, we must particularly mention scrofulous enlargement, and caries;[11] still more rare is the partial destruction by aneurysm[12] and superjacent encysted tumours; necrosis with reproduction,[13] exostosis,[14] and osteosarcom.[15]

(1) *Hochstädter* D. de spina bifida. Altdorf, 1703.

(2) *Thilow* Beschreib. anat. pathol. Gegenstände. Vol. I. No. 6. — *Cerutti* Beschreibung der pathol. Präparate zu Leipzig, No. 484 and 485.

(3) I have also seen this in a lioness. v. Verzeichniss, No. 3482 and 3483.

(4) *v. Sömmerring* Vom Baue des menschl. Körpers. 2d edit. Vol. I. p. 414.—I have found this also, v. Verzeichniss, No. 2150.—*Sandifort* Mus. anat. Vol. I. p. 222, No. 541.

(5) *Sandifort* Mus. anat. Vol. II. pl. 99; Vol. III. p. 212, No. 419—424; p. 383, No. 593; p. 384, No. 598 and 599. v. my Verzeichniss, No. 3492. — *Löseke* Observ. anat. chir. p. 11.—[Mus. Roy. Coll. Surg. No. 436. T.]

(6) Allg. Historie der Natur. Vol. II. p. 68, No. 201. — *Ratier* in Hist. de la Société de Médec. 1779.—*Köhler*, p. 11, No. 40.—*Walter* Mus. anat. II. p. 70, No. 445.—*G. Sandifort* Mus. anat. Vol. III. p. 239, No. 661 and 662. — I have seen a similar case in a living person.—[No. 296 and 297 Mus. Roy. Coll. Surg. in both of which the humerus has become anchylosed to the scapula, by ossification of the capsular ligament; but the articular surfaces have not taken on the ossific inflammation. Both specimens are from a feline animal, but of what genus is not known. T.]

(7) *Adoue* D. de fractura Scapulæ. 4to. Paris, 1787. — *Vogt* Anat. physiol. chirur. Abhandlung eines sehr seltenen Bruches zweier Schulterblätter und des rechten Schlüsselbeins. 4to. Leipzig, 1800.

(8) I saw a recent instance of this disease in a man, in consequence of a blow, and a united transverse fracture in the Mus. Pathol. at Vienna.—A united fracture of the shoulder-blade is described by *Lobstein* Compte rendu, etc. Strasb. 1824, p. 64, No. 78.—I found a similar instance of this kind in a wolf. v. No. 3490 of my Verzeichniss.

(9) *Sandifort* Mus. anat. Vol. III. p. 186, No. 247 and 248; p. 101, No. 338.—A hole made by trepanning in a horse at Alfort, is not entirely closed. v. *Rudolphi* Bemerkungen auf einer reise, Part II. p. 56.

(10) *Flormannn* resp. *Nerman* D. de articulationibus sic dictis accidentalibus. 8vo. Lund. 1821, p. 8.

(11) In scrofulous and syphilitic persons, in diseases of joints, &c. No. 3484—3487, 3489; *Sandifort* Mus. anat. Vol. II. tab. 99, fig. 5 and 6.

(12) From an aneurysm of the art. subscapularis, v. *Liston*, in Edinb. med. and surg. Journ. Jan. 1820.

(13) *Chopart* resp. *Robert* De necrosi ossium theses. Paris, 1776, p. 7. — An instance in a horse at Alfort. v. *Rudolphi*, p. 55; the engraving of it in Edinb. med. and surg. Journ. April, 1823, p. 217, fig. 1 and 3.—A similar case in the Veterinary School at Berlin. v. *Kortum* D. experimenta et observationes circa regenerationem ossium. 4to. Berol. 1824, p. 8, fig. 1 and 2.

(14) A fungous exostosis. *Bondin* in Lond. med. and phys. Journ. Vol. XLVI. August, 1821. — A large one on the shoulder-blade and collar-bone, *Köhler*, p. 11, No. 39.—A cauliflower-like one, *Lobstein*, No. 79. Compare No. 3488 and 3489 of my Verzeichn.—In a horse, around a trephine aperture, at Alfort. v. *Rudolphi*, p. 56.

(15) *Heymann* in *Rust's* Magazin f. die ges. Heilkunde. Vol. XIX. Part III. p. 505.

§ 141.

As to the OTHER BONES OF THE UPPER EXTREMITIES, they as well as the last mentioned are often DEFICIENTLY formed in very different degrees; in many cases, in the little rudiment of the upper limb, we find only a more or less imperfect piece of the upper-arm-bone, or this may be wanting at the same time with the fore-arm, and the hand articulated with the blade-bone,[1] or if only the fore-arm be deficient, with the extremity of the upper arm;[2] frequently also are the bones of the fore-arm deficient, inasmuch as there is only one of them present, to which the imperfect hand is attached; or if that be deficient, it terminates short and pointed:[3] the bones of the hand are frequently deficiently formed, and owing to the want of all or individual fingers, they are consolidated or shortened. Without, however, any external deformity of the hand, one of the bones in the metacarpus may be missed.[4] We find also, on the contrary, SUPERNUMERARY BONES on the fore extremities, and then not merely with excessive number of the fingers, but also with otherwise well-formed joints; for instance, in the metacarpus,[5] a phalanx too many on the fingers(?),[6] unusual sessamoid bones at the elbow joint,[7] &c.

The FORM of the bones of the upper extremities varies not merely as to their different formal vices, in numerous ways, from what is regular,[8] but is also frequently changed by diseases; for instance, in imperfect growth of certain regions,[9] in arms lamed[10] and curved by rickets, in club-hands, from DISLOCATION,[11] &c.

VICES OF CONNEXION, both DISLOCATIONS and ANCHYLOSIS,[12] as well as FRACTURES[13] and WOUNDS, are naturally very common in the bones of the upper extremities of man; in animals also similar vices are not unfrequent.[14]

VICES OF TEXTURE, of the most different kinds, very frequently occur in the fore extremities both of man and animals, as RICKETY ENLARGEMENT, CARIES, SPINA VENTOSA,[15] NECROSIS, EXOSTOSIS, and OSTEOSARCOM.

(1) *Dumeril* in Bulletin de la Soc. philom. Vol. III. p. 122.—I have seen a similar case. v. No. 2894, my Verz.

(2) *Flachsland* Obs. anat. pathol. Rastad. 1800, p. 44. — *Palletta* Exercit. pathol. I. p. 139, fig. 9.—*Hesselbach* Beschreib. der pathol. Präparate zu Würzburg, p. 13, No. 71 and 72.

(3) Of all these vices I have instances before me.—Absence of the radius is not rare when there is no thumb, and in bending inward of the hand. I have seen this four times.—Similar cases are given by *Wiedemann* in *Isenflamm's* and *Rosenmüller's* Beitragen zur Zergliederungskunst. Vol. I. Part I. p. 42; and *Fleischmann* in Leichenöffnungen, p. 259, No. 92. — Compare the different malformations further on, and the observations on the extremities in particular.

(4) *Sandifort* Observat. anat. pathol. L. III. C. X. p. 136.

(5) *Salzmann* Decas Observat. anat. Argentor. 1725, p. 3, rev. in *Halleri* Coll. Diss. anat.—Nine carpal bones in man. v. Vol. VI. p. 69. — *Sandifort.*— In the horse, ten bones instead of seven in the carpus. v. *Pilger* Handbuch der Veterin-Wiss. Vol. II. p. 527.—On a rana temporaria, a supernumerary carpal bone, v. *Carus* Von den Urtheilen des Knochen-und Schalengerüstes. fol. Leipzig, 1828, p. 133, § 590.

(6) *Columbus* De re anatomica, p. 485.

(7) A large one on the olecranon. *Chenal* Observ. botan. 4to. Basil. 1766, § 28; and *Rosenmüller* D. de sing. et rar. oss. c. h. variet. p. 62.—One on the point of the coronoid process. v. *von Sömmerring* Vom Baue des Menschl. Körpers. 2d edit. Vol. I. p. 425.

(8) As a rare example, I have once seen the bicipital groove wanting on the upper-arm-bone, with deficiency of the long head of the M. biceps cubiti.—Less rare is the communication between the anterior and posterior pits at the lower part of the bone.

(9) For instance, the fore-arm, on account of disease in youth. v. No. 3503 and 3504 of my Verzeichn.

(10) I have described a good instance in my Selt. Beob. II. p. 32, and Verzeich. No. 3502.

(11) The form of the head of the upper arm varies much, especially if it be dislocated; in which case it is, as it were, compressed and flattened.

(12) Many instances of it in Bresl. Mus. No. 3572—3574.

(13) The lesser fractures are easily overlooked; to wit, that of the olecranon. On this fracture, v. *de Plouquet's* Repertor. Art. Olecranon; also *Camper* and *Alcock*, &c. § 142, note 8. — *Bizion* D. de fractura olecrani. 4to. Paris, 1786; and *Feiler* Ueber den Bruch des Olecranums, nebst einer neuen Methode denselben zu heilen. 8vo. Sulzbach, 1811.—On fracture of the processus coronoideus, v. *Schrebelius* D. de fracturis in genere et de fracturæ cubiti natura et curatione. Basil. 1602.—*Combes Brassard* Sulla frattura del' apofisi coronoide del cubito. Montauban. 1811.—*Kühnholz* in Ephémérides médicales de Montpellier. March, 1826.—Several instances of united fracture of the bones of the arm, in Bresl. Mus. No. 3577—3593.

(14) Especially anchyloses in the horse.—On the skeleton of a monkey, in the Zoot. Mus. at Paris, between the fore-arm and carpus.—In a wolf, v. my Verzeichn. No. 3575 and 3576.—In a bird, No. 3594.—At Alfort, I saw, in a dog, in dislocation, a new articular pit formed on the olecranon, for the humerus.

(15) I have recently seen some remarkable cases in the Mus. Anat. Pathol. at Vienna; viz. on the lower end of the ulna, a spina ventosa, as big as an ostrich egg; and two cases on the end of the radius, as big as the head of a child two years old.—It also occurs in animals; thus I found it on the ulna of a horse, on the metacarpal and pastern bones of an ox, at Alfort.—On the great wing-bone of a parrot, in the Mus. of *Sandifort.* v. *Rudolphi,* Part I. p. 131.

D.—OF THE BONES OF THE LOWER EXTREMITIES.

§ 142.

The bones of the lower extremity, like those of the upper, are found congenitally DEFICIENT, inasmuch as they may be

altogether wanting, or only imperfectly developed in certain regions.[1] But they have this peculiarity, that, in the syren-like monsters, there exists a greater or less degree of CONSOLIDATION; the frame-work of two extremities indeed is found, which are merely connected below at the feet alone, or at the knees, or there may be only the frame-work of one lower extremity, in which case, however, by the greater breadth and duplicity of the articular surfaces we can distinguish the consolidation of the two; at the same time all the bones may be so turned round upon their axis, that the parts usually in front are situated behind.[2]

The opposite vice, or the EXCESSIVE NUMBER of bones in a more or less double lower extremity is at once shown by its external form.

The SIZE and FORM of the bones in the lower extremities frequently appear irregular; to these belong especially, the disproportionate shortness or length of the bones of the thigh and leg, or only in one of these regions; their occasional unequal length in the two extremities; the articular extremities very often rendered too broad in rickets, and as it were dislocated; the crookedness of the long bones, which is no where else so common and so great, partly congenital, partly produced especially by rickets; the malformation of the bones of the foot, in club-foot,[3] and from wearing too small shoes; and the partially congenital,[4] partially acquired[5] varying forms of the upper end of the thigh-bone.

VICES OF CONNEXION AND CONTINUITY which originate in the form and use of the bones of the lower extremity are very common. To the former belong the displacement of the metatarsal bones in club-foot, DISLOCATIONS[6] from external and internal causes, and ANCHYLOSIS;[7] to the latter, the various FRACTURES, of which those of the NECK OF THE THIGH-BONE[8] and the KNEE-CAP,[9] usually exhibit much difficulty of union by callus.[9*]

VICES OF TEXTURE occur in the bones of the lower extremities in man still more frequently than in those of the upper, which may indeed arise from their more active employment, and the more ready influence of injurious causes upon them; to these especially belong, the RICKETY INFLAMMATORY SWELLING of the small bones, as the knee-cap and the bones of the feet, as well as the articular ends of the tubular bones; CARIES, which especially in morbus coxarius,[10] and in the bones of the knee joint,[11] is as common as it is dangerous; SPINA VENTOSA, which often produces very large swellings, especially on the thigh and shin-bones;[12] NECROSIS which occurs particu-

larly on the shin-bone and often on the thigh;[13] the common BONY GROWTHS,[14] and DEPOSITION OF GOUTY TOPHUS, OSTEOSARCOM,[15] &c.

(1) v. below in the extremities; a mere rudiment of the thigh-bone has been seen several times—in the case described by *Dumeril;* although there was on each side a rudiment of the thigh-bone, consisting merely of the head and trocanters, the single bone which formed the leg was not attached to it, but articulated with the inferior anterior spinous process of the ilium. In another case there was merely a single bone between the pelvis and the foot. v. *Dumas* Principes de Physiologie, Vol. III. p. 163.—Sometimes the foot is directly attached to the pelvis, v. *Bouchard,* Eph. Nat. Cur. Dec. I. Ann. III. c. 12; or to the lower extremity of the thigh-bone, v. *Flacksland,* &c.; at the same time with the outer toe in one instance was the fibula wanting, except a small portion of its lower end, v. *Meckel,* Handb. der pathol. Anat. Vol. I. p. 750.—In another case of the foot there were only the hinder three tarsal bones present. v. *ib.* p. 751, &c.—In a syren monster I missed the knee-cap at the knee-joint. v. Monstror. sex humanor. anat. et phys. disquisitio, p. 40. [In the Mus. Roy. Coll. Surg., No. 105, a fœtus, in which both the lower extremities are deficient, and the trunk terminated in a rounded stump about two inches long, with a depression in it resembling an anus.—No. 106 of the same collection, a fœtus, in which there is a slight projection from the back of the sacrum, like a rudiment of an extremity. Unfortunately neither of these preparations are dissected, so that no further account can be given. T.]

(2) Compare below in the extremities.

(3) *Ib.*

(4) In the syren monsters with but a single thigh-bone, the neck is wanting, and the head is attached on the extreme end of the bone. In a cretin, the neck was wanting, and the malformed head was attached much lower down. v. *Prochaska* Disquis. anat. physiol. organ. c. h. explicatio. tab. 8, and engraving, tab. 11, fig. 2.—We observe the head of the thigh-bone variously malformed, sometimes in congenital lameness; otherwise also, however. v. *Palletta* Exercit. de claudicatione congenita. L. B. 1787, § 82, and Exercit. pathol. Vol. I.—In rare instances the pit on the head of the thigh-bone for the round ligament is deficient. v. *Genga* Anatomia chirurgica, 8vo. Rom. 1687, p. 124.—*Nicolai* præs. *Salzmann* Decas Observat. anatom. Argent. 1725, p. 10., abbreviated in *Haller's* Select. Diss. Vol. VI. p. 694.—*Caldani* Institut. anat. Vol. I. p. 145, and *Palletta* Exercit. pathol. Vol. I. p. 65.—*Bonn* Thesaurus ossium morbos. No. 22, 43, 47.—*Sandifort* Observat. anat. pathol. L. III. c. 10, and Mus. anat. Vol. I. p. 203, No. 271; Vol. II. tab. 77, fig. 1 and 2.—*Prochaska.*—The pit and ligament are, however, sometimes destroyed also by disease, viz. gout. v. *Sömmerring* Vom Baue des menschl. Körpers. 2d edit. Vol. I. p. 482, and in *Blumenbach's* medic. Bibliothek. Vol. III.

(5) For instance, after dislocation, in which the head and neck of the thigh-bone are often very much changed; thus the former becomes flattened, the latter often shortened and distorted; after gouty affections, and other inflammatory forms of disease, both sometimes become much swollen and mishapen; beautiful delineations of both vices are given in *Sandifort's* Museum anat. Vol. II. tab. 65—74.—Compare *B. Bell,* Remarks on interstitial Absorption of the Neck of the Thigh-bone. Lond. 1824.

(6) Among dislocations from mechanical causes, that of the foot is the most frequent; among the spontaneous, that of the hip in coxarthrocacy; upon congenital dislocation of the hip-joint. v. *Dupuytren* in Repertoire général d'Anatomie, etc. Vol. II. p. 151, pl. 4.—Sometimes also merely the knee-cap is dislocated. v. *le Vacher* Theses de variis patellæ luxationibus. Paris, 1761; it then rubs for itself a chase at some other part of the thigh-bone. v. Verzeichniss, No. 3882.—*Moreau* in *Sédillot's* Rec. période de la Soc. de Médec. Vol. LXIV. p. 79; the so-called strain in the whirlbone, or stiffle strain in the thigh of the horse, is a true dislocation of the patella.

Spontaneous reduction of dislocation of the thighbone on the back of the hip bone[x] by James Comish in Lond. Med. Rep. March 1822 /[x] two years after the accident /

(7) Imperfect anchylosis of the hip-joint is not rare; there are several instances in the Bresl. Mus. viz. No. 3425, 3436—3439; Allg. Historie der Natur. 2ter Theil, p. 72. No. 222—225.—*Sandifort* Mus. anat. Vol. II. tab. 69, fig. 1 and 2, tab. 72—74.—More rare is perfect anchylosis. v. *Hildanus* in Op. p. 882.—*de Haen* Rat. medend. Vol. I. p. 360.—Allgem. Historie der Natur. Part II. p. 24, No. 226, 230, tab. 3. — *van der Wynpersse* D. de ancylosi, p. 41, § 38.—*Kohler*, p. 14, No. 56—62. — *Walter*, Mus. anatom. Vol. II. p. 71, No. 446; and *Sandifort*, Vol. II. tab. 75 and 76; Vol. III. p. 240, No. 671, instances are mentioned.—It has also been found in a horse at Hanover. v. *Rudolphi* Bemerkungen auf einer Reise, u. s. w. Vol. I. p. 77. — The anchylosis of the thigh-bone, with the shin-bone, the splint-bone, and knee-cap, altogether, or singly, is not uncommon. v. No. 3440, 3883—3885 of my Verzeichn. — Still more frequently does it occur between the shin and splint bones, at the ankle joint, and between the bones of the foot. v. No. 3886—3889 of Bresl. Mus.—[Among the preparations of anchylosis, in the Mus. St. Thomas's Hospital, there are several fine specimens of this disease in almost every joint; among them is one very interesting case of fibro-cartilaginous anchylosis in the knee-joint of a child; and a bony anchylosis of the knee-joint, by which all the three bones are connected, but in a very remarkable manner, the leg being bent forwards at a right angle upon the thigh. T.]—On the foot of the horse, it is especially in ring-bone and spavin not unfrequent.—[In Mus. St. Thomas's Hospital, there is a cast of a simple dislocation of the head of the tibia upon the thigh-bone, in which the tibia is thrown backwards: a very rare accident. T.]

(8) *Salzmann* D. de curatione ossis femoris rariore, frequentiore colli fractura. Argentor, 1723, rev. in *Haller's* Coll. Diss. chir. IV. No. 145.—*Bordenave* D. de fractura colli femoris. Paris, 1771.—*Ludwig* Pr. de fractura colli femoris. Lips. 1755, in *Haller*, No. 146.—*Haase* Pr. de fractura colli ossis femoris cum luxatione capitis ejusdem ossis conjuncta. Lips. 1801.—*Richerand* Dissert. sur les fractures du col de femur, etc. Paris, Ann. VII.—*Gerard*, Mémoires sur les fractures du col de femur. Gand. 1805.—*Hagedorn*, Abhandl. über den Bruch des Schenkelbeinhalses. 8vo. Leipz. 1808.—*Meyer* D. observationes circa fracturam colli ossis femoris. Gryphisw. 1810. — The fracture usually heals only by a mass of ligament, not by bony substance.—*A. Cooper*, in his and *B. Travers's* Surgical Essays, Vol. II. 2d edit. Lond. 1820, pl. 1—3; and in his treatise on Dislocations and on Fractures of the Joints, Lond. 1823, and in Observations on the Fracture of the Neck of the Thigh-bone, &c. 4to. Lond. 1823, with plates, first held that this fracture was not united by callus, but by a ligamentous mass.—*Colles*, in Dublin Hospital Reports, &c. Vol. II. Dublin, 1818, found this confirmed in nine cases. Similar is the opinion of *C. Bell*, in Observations on the Injuries of the Spine and of the Thigh-bone, &c. 4to. Lond. 1824, with plates; *J. Wilson*, On the Structure and Physiology of the Skeleton, Lond. 1820, p. 243, and *H. Mayo* in London med. and phys. Journ. Decbr. 1826.—The opposite opinion is held by *Earle* in Practical Observations in Surgery, Lond. 1823; London med. and surg. Journ. by *Macleod* and *Bacot*, Vol. L. October, 1823, though without mentioning cases of union. A rare notice of such cure is given by *Liston* in Edinb. med. and surg. Journ. April, 1820.—*van Houte* D. de collo femoris intra ligamentum capsulare fracto et rite sanato. 8vo. Amstelod. 1824, with engravings.—*Dzondi*, De colligendo, conservando, disponendo et inspiciendo Museo anat. pathol. 8vo. Halæ, 1825, p. 13, had seen cases of this kind in Leyden and Brunswick; an instance is described by *Begbie* in Edinb. Journ. of med. Sciences, Jan. 1826; several instances by *G. Sandifort*, Mus. anat. Vol. III. p. 206, No. 379 and 380, p. 346, No. 273; incipient cure, p. 204, No. 359. I saw a case of this kind in the Anat. Mus. at Dresden, and if I be not mistaken also in *Soemmerring's* Museum; the cases I have observed, No. 2147, 2148, 3892—3895, and 3925, in Bresl. Mus., exhibit no callous union. I have, however, once seen the neck of the thigh-bone penetrating, as it were, and driven into the cavity of the bone itself, as was observed by *Dessault* several times, and engraved by *Sandifort*, Vol. II. tab. 78, fig. 4—7.—[This is by no means an uncommon accident; there are several specimens of it in the Mus. at St. Thomas's; and among others, one sent by *Roux*, as an instance of fractured neck of the thigh-bone united by bone from which it is quite distinct.—The

fractured neck of the thigh-bone of English surgeons being always within the capsular ligament. T.]—An ununited fracture of the neck of the thigh-bone in a young stag is mentioned by *Sandifort*, Vol. III. p. 346, No. 272.—*J. Amesbury*, Observations on the nature and treatment of fractures of the upper third of the thigh-bone, and of fractures of long standing. 8vo. London, 1828, with plates. —Instances of cure of fractured neck of the thigh-bone by callus are related by *Langstaffe* in Med. Chir. Trans. Vol. XIII. Part II. p. 487, London, 1827.—*G. Sandifort* in Niewe Verhandelingen dereeste Klasse vanhet K. Neederlandsche Institut van Vetenschappen. Amsterd. 1827, Vol. I. No. 1, two instances; and *Brulatour*, in Revue méd. franc. et étrang. Dec. 1827, Vol. IV. p. 398.—[A case of fracture of the neck of the thigh-bone united by bone occurred to *Swan*, and is to be seen at the Mus. Roy. Coll. Surg.—Another case occurred to *Stanley*, and is, I believe, in the Mus. at St. Bartholomew's Hospital. —A third to *Chorley*, of Leeds. T.]

(9) v. *de Plouquet* Repertor. Art. Patella.—*Meibomius* de patellæ osse, ejusque læsionibus et curatione. Frank. 1697; *Langguth* D. de fractura patellæ genu. Viteb. 1745.—*Koole* D. de patellæ fractura. Franequer, 1761.—*Allough* D. de patellæ transversa fractura. Paris, 1775.—*Deidier* De patellæ transversa fractura. Paris, 1775.—*P. Camper* D. de fractura patellæ et olecrani. 4to. Franequ. 1754, and Hagæ Comit. 1789.—*Sheldon*, An essay on the fracture of the Patella or Knee-pan. Lond. 1789.—*Hierbuur* D. de fractura patellæ. Franequer, 1790.—*Buirer* in *v. Siebold's* Chiron. Vol. III. Part I. p. 64.—*Keller* De ossium emollitione morbosa, de perfracti genuum orbis sanationis rarioris causa, etc. L. B. 1816.—*Linon* D. de fractura rotulæ. L. B. 1816.—*Fielding*, A case of transverse Fracture of the Patella, in which perfect osseous union was procured. 8vo. Lond. 1822.—*de Zutter* D. de rotulæ fractura et curativa methodo. 4to. Gandæ, 1823.—*Alcock*, Practical Observations on fracture of the Patella and of the Olecranon. 8vo. Lond. 1823. *Fest* D. de fractura patellæ. 4to. Berol. 1827. — *Ortalli* D. de fr. pat. 8vo. Berol. 1827. — *Callisen*, in Actis reg. Soc. med. Havn. Vol. I. p. 307; and *A. Cooper*, are of opinion that the transverse fracture of the knee-cap, which usually originates in muscular exertion, is never cured by callus, although many instances are given, besides the several cases of the above authors, by *Lallement*. v. in *Boyer* Traité des malad. chir. Vol. III. p. 355, pl. 3 and 5. — *Wilson*, p. 240.—*Langenbeck* in D. N. Bibliothek f. d. Chir. und Ophthalm. Vol. III. Part I. — *Rodati* in Opusc. scientif. Fasc. XII. p. 377, after comminuted fracture.—*Bleuland* Descriptio. Mus. anat. p. 275, No. 1519.—I have also seen one instance in *W. Hunter's* Mus., and another in the Anat. Mus. at Prague.— I once found a piece of the outer edge of the knee-cap well united, after a perpendicular fracture. v. No. 3908 of my Verzeichniss.

(9*) [Some few years back there was, in the Mus. at Thomas's, a very remarkable instance of fracture of the tibia ununited, in which the fibula, which had remained perfect, increased exceedingly in size, and performed the office of the tibia in supporting the body. It has unfortunately disappeared. T.]

(10) Compare below, § 150.

(11) *J. Russell*, upon Diseases of the Knee-joint.

(12) Compare above, § 116.

(13) *T. Whately*, Practical Observations on Necrosis of the Tibia, &c. 8vo. Lond. 1815, with an engraving.

(14) Compare above, § 119.

(15) Rare on the smaller bones. For instance, on the inside of a knee-cap.—*G. Sandifort* Mus. anat. Vol. III. p. 141, No. 4, on the first phalanx of the thumb.—*Ehrmann* Compte rendu, etc. Strasburg. 1827. p. 60, No. 418, b.

Cows skinned by lightning & stockers bo